STIC Search Report
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STIC Database Tracking Number: 127947

TO: Binta M Robinson **Location: REM 3D06** **Art Unit: 1625** **July 23, 2004** **Case Serial Number: 10/657732**	**From: P. Sheppard** **Location: Remsen Building** **Phone: (571) 272-2529** **sheppard@uspto.gov**

Search Notes

Access DB# 127947

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Binta Robinson Examiner #: 76704 Date: 7/23/04
Art Unit: 1625 Phone Number 306-5457 Serial Number: 10657732
Mail Box and Bldg/Room Location: 3006/CM1 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

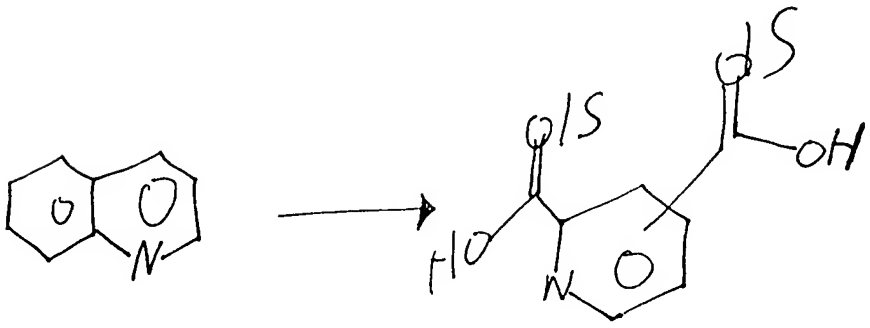
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc. if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Process For Producing 2,3-Pyridinedicarboxylic Acid

Inventors (please provide full names): Sato et. al.

Earliest Priority Filing Date: _____

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*



See claims 1-9

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STAFF USE ONLY Type of Search Vendors and cost where applicable

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FILE 'HCAPLUS' ENTERED AT 14:33:16 ON 23 JUL 2004
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FILE LAST UPDATED: 22 Jul 2004  (20040722/ED)

 This file contains CAS Registry Numbers for easy and accurate
 substance identification.


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L3                STR
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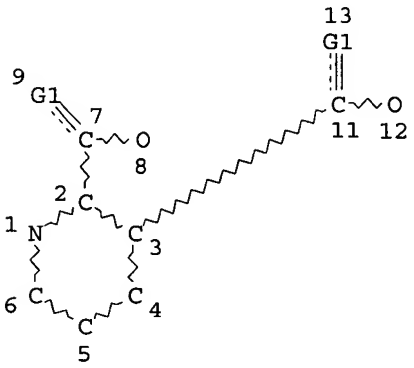


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DEFAULT ECLEVEL IS LIMITED

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NUMBER OF NODES IS  12

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L13           67 SEA FILE=REGISTRY ABB=ON  PLU=ON  8-HYDROXYQUINOLIN?/CN
L15        87365 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 OR L13 OR QUINOLIN? OR
                 HYDROXYQUINOLIN?
L17          760 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L11/P
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L27      3458592 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 OR METAL
L28       997769 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 OR MINERAL
L29            1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND (L24 AND L27 AND L28)



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=> d ibib abs hitstr l29 1

L29  ANSWER 1 OF 1  HCAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:         2004:552060  HCAPLUS
TITLE:                    Preparation of high-purity 2,3-pyridinedicarboxylic
                          acid
INVENTOR(S):              Sato, Toshio; Namekata, Takeshi
PATENT ASSIGNEE(S):       Sumikin Air Water Chemical Co., Ltd., Japan; Hebei
                          Chong Hua Fu Heng Co., Ltd.
SOURCE:                   Jpn. Kokai Tokkyo Koho, 12 pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.        KIND  DATE           APPLICATION NO.  DATE
     ---------------   ----  --------       ---------------  --------
     JP 2004189651      A2   20040708       JP 2002-358020   20021210
PRIORITY APPLN. INFO.:                   JP 2002-358020      20021210
AB   Title compound (I) is prepared by (A) oxidation of (8-hydroxy)quinoline
     in the presence of Cu ion, (B) treatment of the resulting I
     Cu salt with alkali in solvent, (C) acidifying the alkali
     metal salt with mineral acid, and separating the precipitated I.
     The residual solution is reused as solvent in the step A or B, or is treated
     with Cu (compound) to recover I Cu salt and to recycle
     in the step B.  Thus, quinoline was oxidized with NaOCl at
     98-103° for 17 h in the presence of CuSO4.5H2O and H2SO4 in H2O,
     decomposed with aqueous NaOH, acidified, and filtered to give 50.9% I with 99.8%
     purity.  The filtrate was reused in the oxidation of quinoline to
     complete the reaction in 10 h.  The product was then similarly decomposed
     and acidified to give 58.2% I with purity 99.9%.
IT   15109-10-1P, Disodium 2,3-pyridinedicarboxylate
     RL: IMF (Industrial manufacture); PUR (Purification or recovery); RCT
     (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
     (Reactant or reagent)
        (recycling of waste solns. in preparation of pyridinedicarboxylic acid from
        (hydroxy)quinoline)
RN   15109-10-1  HCAPLUS
CN   2,3-Pyridinedicarboxylic acid, disodium salt (8CI, 9CI)  (CA INDEX NAME)
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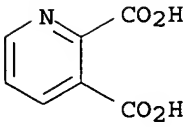
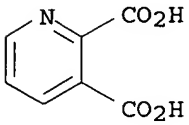
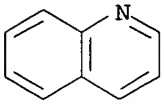


●2 Na

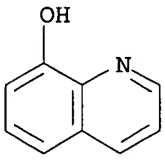
IT **89-00-9P**, 2,3-Pyridinedicarboxylic acid
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(recycling of waste solns. in preparation of pyridinedicarboxylic acid from (hydroxy)**quinoline**)
RN 89-00-9 HCAPLUS
CN 2,3-Pyridinedicarboxylic acid (8CI, 9CI) (CA INDEX NAME)



IT **91-22-5**, **Quinoline 148-24-3**, 8-**Hydroxyquinoline**
RL: RCT (Reactant); RACT (Reactant or reagent)
(recycling of waste solns. in preparation of pyridinedicarboxylic acid from (hydroxy)**quinoline**)
RN 91-22-5 HCAPLUS
CN Quinoline (8CI, 9CI) (CA INDEX NAME)



RN 148-24-3 HCAPLUS
CN 8-Quinolinol (7CI, 8CI, 9CI) (CA INDEX NAME)



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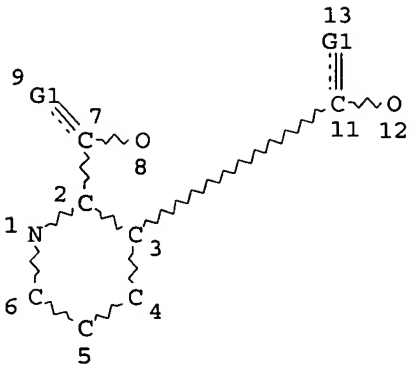

VAR G1=O/S
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 12

STEREO ATTRIBUTES: NONE

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L11        2416 SEA FILE=REGISTRY SSS FUL L3
L12           1 SEA FILE=REGISTRY ABB=ON  PLU=ON  QUINOLINE/CN
L13          67 SEA FILE=REGISTRY ABB=ON  PLU=ON  8-HYDROXYQUINOLIN?/CN
L15       87365 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 OR L13 OR QUINOLIN? OR
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L17         760 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L11/P
L18         249 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 AND L15
L20           5 SEA FILE=REGISTRY ABB=ON  PLU=ON  COPPER/CN OR ("COPPER
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L22       10886 SEA FILE=REGISTRY ABB=ON  PLU=ON  METAL
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L30           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND L24 AND L27 AND L28
L31          15 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND L24
L32          14 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L31 NOT L30
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L32 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN

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ACCESSION NUMBER:        2002:849740  HCAPLUS
DOCUMENT NUMBER:         137:339045
TITLE:                   Compositions containing oxidation-resistant
                         water-soluble dyes of copper phthalocyanine
                         compound complexes and their use in recording fluid
INVENTOR(S):             Takahashi, Kaoru
PATENT ASSIGNEE(S):      Daiwa Dyestuff Mfg. Co., Ltd., Japan
SOURCE:                  PCT Int. Appl., 39 pp.
                         CODEN: PIXXD2
DOCUMENT TYPE:           Patent
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LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002088256	A1	20021107	WO 2002-JP4331	20020430
W: US				
RW: DE, FR, GB				
JP 2003034758	A2	20030207	JP 2002-128305	20020430

PRIORITY APPLN. INFO.: JP 2001-133308 A 20010427
OTHER SOURCE(S): MARPAT 137:339045
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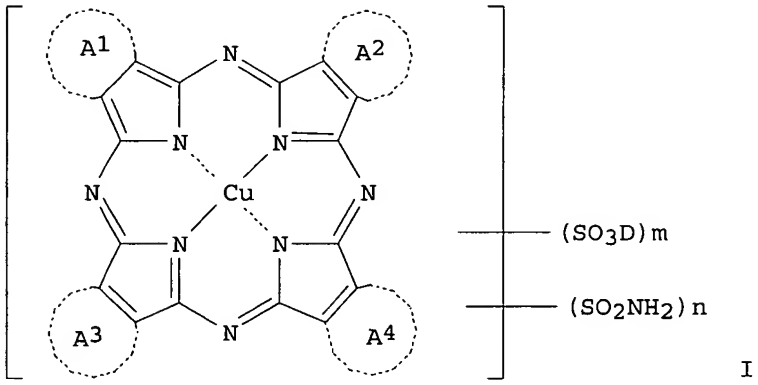

I

AB A water-soluble dye comprising a compound represented by the following general formula I wherein at least one of the 4 rings (A1) to (A4) represents an alkylbenzene ring or benzene ring or at least two thereof represent an alkylbenzene ring and a benzene ring, resp., and the remaining rings each represents a pyridine ring or chlorobenzene ring; -SO3D and -SO2NHR are substituents present on (A1) to (A4); D represents a monovalent alkali metal, ammonium, or an organic ammonium; m is 1 to 4; -SO2NHR represents -SO2NH2 or a sulfonamide residue capable of forming a complex together with a **copper** ion; and n is 0 to 3, provided that when n is 0, then not all of the four rings (A1) to (A4) are a benzene ring. Thus, mixing phthalic anhydride 30.0 with **quinolinic** acid 20.3, cuprous chloride 12.2, urea 66.1 and Sb molybdate 0.28 g in 170 mL 1,2,4-trichlorobenzene at 175±5° for 5 h and working up gave a **Cu** phthalocyanine complex which was sulfonated with chlorosulfonic acid and neutralized with NaOH to give a sulfonate salt compound having λmax 611 in water and useful for ink-jet ink.

IT **89-00-9DP**, **Quinolinic** acid, sulfonated **Cu** phthalocyanine complexes and derivs.
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(dyes; compns. containing oxidation-resistant water-soluble dyes of **copper** phthalocyanine compound complexes and their use in recording fluid)

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:399746 HCAPLUS

DOCUMENT NUMBER: 131:138396
TITLE: Synthesis and studies on **copper**(II) and lead(II) polyurethanes
AUTHOR(S): Srinivasan, K.; Thamizharasi, S.; Gnanasundaram, P.; Rao, K. Venkata; Balasubramanian, S.
CORPORATE SOURCE: A. C. College of Technology, Chennai, 600 025, India
SOURCE: Journal of the Indian Chemical Society (1999), 76(1), 10-12
CODEN: JICSAH; ISSN: 0019-4522
PUBLISHER: Indian Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Metal-containing polyurethanes were synthesized by the reaction of mono(hydroxyethyl)**quinolinate-copper**(II) with isophorone diisocyanate/toluene diisocyanate and mono(hydroxyethyl)phthalate-lead(II) with isophorone diisocyanate in DMF, and characterized by spectroscopic and thermal studies. The decomposition temps. of these polymers are significantly lower than those of metal-free polymers. However, the rates of decomposition of metal-containing polyurethanes were lower than those of polyurethanes having no metal atom.

IT **233691-43-5P 233691-44-6P**
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and thermal studies of polymeric)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1998:398237 HCAPLUS
DOCUMENT NUMBER: 129:81732
TITLE: Process for the preparation of heterocyclic o-dicarboxylic acids
INVENTOR(S): Suverkropp, Geertrudes Herman; Alsters, Paulus Lambertus; Snijder, Carina Sacha; De Vries, Johannes Gerardus
PATENT ASSIGNEE(S): DSM N.V., Neth.
SOURCE: Eur. Pat. Appl., 5 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 847993	A1	19980617	EP 1997-203884	19971211
EP 847993	B1	20010816		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BE 1010804	A3	19990202	BE 1996-1046	19961216
JP 10245373	A2	19980914	JP 1997-369795	19971211
AT 204254	E	20010915	AT 1997-203884	19971211
US 5917049	A	19990629	US 1997-989404	19971212

PRIORITY APPLN. INFO.: BE 1996-1046 A 19961216
OTHER SOURCE(S): CASREACT 129:81732

AB Heterocyclic o-dicarboxylic acids containing at least one N atom were prepared by oxidation of a corresponding benzo-fused heterocyclic compound containing at least one N atom in the presence of H2O2, a Bronsted acid and an iron compound Fe(NO3)3 (0.1-2 mol.% relative to benzo-fused heterocycle) as the iron compound and HNO3 as the Bronsted acid are preferred. Even higher yields can be obtained if a **copper** compound or an organic electron-transferring compound is also used (in addition to the iron compound).

In particular, the process according to the invention can be used to prepare 2,3-pyridine dicarboxylic acids from corresponding **quinoline** compds.

IT **89-00-9P**, 2,3-Pyridinedicarboxylic acid **53636-65-0P**, 5-Methyl-2,3-pyridinedicarboxylic acid
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(process for the preparation of heterocyclic o-dicarboxylic acids)

IT **91-22-5**, **Quinoline**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(process for the preparation of heterocyclic o-dicarboxylic acids)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1990:406374 HCAPLUS
DOCUMENT NUMBER: 113:6374
TITLE: Preparation of 6-Chloropyridine-2,3-dicarboxylic acid and other heterocyclic dicarboxylic acids
INVENTOR(S): Horiuchi, Kenichiro; Matsumoto, Mansuke
PATENT ASSIGNEE(S): Yamamoto Kasei K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 01246260	A2	19891002	JP 1988-72873	19880325
JP 08002879	B4	19960117		

PRIORITY APPLN. INFO.: JP 1988-72873 19880325
OTHER SOURCE(S): MARPAT 113:6374
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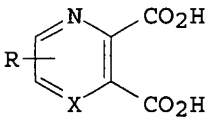

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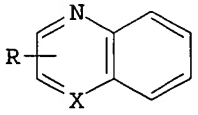

III

AB 6-Chloropyridine-2,3-dicarboxylic acid (I) and heterocyclic dicarboxylic acids II (R = H, C1-4 alkyl, halo; X = C, N; R ≠ H when X = C), useful as intermediates for thermal and pressure-sensitive dyes, drugs, and agrochems., are prepared by oxidation of benzene-condensed heterocycle III with RuO4 under basic conditions. A mixture of 2-chloroquinoline, an aqueous RuCl3 solution, an aqueous NaOH solution, and an aqueous NaClO solution was stirred at 38-42° for 48 h and washed with CCl4, the H2O layer was adjusted to pH 2 and then treated with an aqueous CuSO4 solution at 70-75° for 30 min. The obtained **Cu** salt in H2O was bubbled with H2S at 60-65° for 20 min to give 39.7% I.H2O.

IT **517-40-8P**, 4-Methylpyridine-2,3-dicarboxylic acid
32383-03-2P, Dimethyl 6-chloropyridine-2,3-dicarboxylate
53636-65-0P, 5-Methylpyridine-2,3-dicarboxylic acid
53636-70-7P, 6-Methylpyridine-2,3-dicarboxylic acid
127437-44-9P, 6-Chloropyridine-2,3-dicarboxylic acid
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as intermediate for drugs, agrochems., and thermal and

pressure-sensitive dyes)

L32 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1988:150326 HCAPLUS
DOCUMENT NUMBER: 108:150326
TITLE: Process for the preparation of 5-alkylquinolinic acids.
INVENTOR(S): Pastorek, Emmerich; Orth, Winfried; Jeromin, Guenter; Fickert, Werner
PATENT ASSIGNEE(S): Ruetgerswerke A.-G., Fed. Rep. Ger.
SOURCE: Ger. Offen., 5 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 3614756	A1	19871105	DE 1986-3614756	19860430
EP 247277	A2	19871202	EP 1987-101485	19870204
EP 247277	A3	19880210		
EP 247277	B1	19910911		
R: BE, CH, DE, FR, GB, IT, LI, NL				
JP 62277360	A2	19871202	JP 1987-103442	19870428
JP 06025114	B4	19940406		

PRIORITY APPLN. INFO.: DE 1986-3614756 19860430
OTHER SOURCE(S): CASREACT 108:150326
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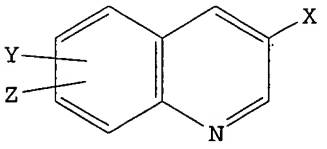


II

AB A procedure for preparing 5-alkylquinolinic acids (I) was characterized in that 3-alkylquinolines II [X = C1-6 alkyl; Y = H, optional group; Z = OR, NRR1, halo, NHNRR1, CO2H, NHCOR; R,R1 = H, (un)substituted C1-8 alkyl, aralkyl, cycloalkyl] are oxidized in acidic, aqueous medium with ClO3- in the presence of vanadyl (V) cations as catalyst. I are intermediates for plant protective agents. A mixture of HCl, AcOH, 2-H2NC6H4OMe, and 2-O2NC6H4OMe was heated to reflux and treated with 2-ethylacrolein to give 78.2% 3-ethyl-8-methoxyquinoline which, in aqueous HCl, was treated with ammonium vanadate, then aqueous NaClO3. The NaClO3 was decomposed with NaHSO3 and the reaction mixture worked up and treated with CuSO4 to precipitate the **Cu** salt of 5-ethylquinolinic acid (III). Reaction of III with aqueous NaOH gave the free acid IV. Treating 3-ethyl-8-methoxyquinoline with fuming HNO3 gave no IV, but rather 3-ethyl-8-methoxynitroquinoline.

IT **102268-15-5DP**, **copper** complex
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reaction of, in preparation of **quinolinic** acid plant protectant intermediate)

IT **53636-65-0P 102268-15-5P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as intermediate for plant protectant)

IT **7440-50-8D**, complex with 5-ethylquinolinic acid
RL: RCT (Reactant); RACT (Reactant or reagent)

NO

(reaction of, in preparation of **quinolinic** acid plant protectant)

L32 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1987:556992 HCAPLUS
DOCUMENT NUMBER: 107:156992
TITLE: Process for 2,3-pyridinedicarboxylic acid manufacture
INVENTOR(S): Michalowicz, William
PATENT ASSIGNEE(S): Ruetgers-Nease Chemical Co., Inc., USA
SOURCE: Eur. Pat. Appl., 20 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

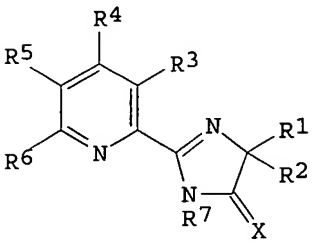
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 232118	A2	19870812	EP 1987-300728	19870128
EP 232118	A3	19890531		
R: AT, BE, CH, DE, ES, FR, GB, IT, LI, NL, SE				
US 4754039	A	19880628	US 1986-824080	19860130
JP 62209063	A2	19870914	JP 1987-18781	19870130

PRIORITY APPLN. INFO.: US 1986-824080 19860130
OTHER SOURCE(S): CASREACT 107:156992
AB 2,3-Pyridinedicarboxylic acid, useful as an intermediate in the manufacture of herbicides, pharmaceuticals, and dyes (no data) is prepared by oxidizing **quinoline** with a chlorate salt and aqueous acid medium in in the presence of Cu2+ generated from an acid-soluble Cu2+ compound A reactor was charged with H2O 267, CuSO4.5H2O 67.4, **quinoline** 34.8, 97% H2SO4 33.8, and NaClO3 101.2 g, the mixture stirred at 98-100° for 17 h under N and was filtered producing 50.1 g of crude **copper** salt of 2,3-pyridinedicarboxylic acid (81% yield), 50.1 g of which was treated with H2O 125, 50% caustic soda 50, and paraformaldehyde 3.8 g at 70° for 1 h, filtered, and filtrate acidified with 53 g 70% HNO3 to pH 1.1, resulting in the precipitation of 26.6 g 2,3-pyridinedicarboxylic acid (62.8% yield based on **quinoline**).
IT **89-00-9P**
RL: PREP (Preparation)
(manufacture of, by **quinoline** oxidation)
IT **7440-50-8**, **Copper**, uses and miscellaneous
RL: USES (Uses)
(oxidation of **quinoline** in presence of, in pyridinedicarboxylic acid manufacture)
IT **91-22-5**, **Quinoline**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, in pyridinedicarboxylic acid manufacture)
IT **18970-62-2P**
RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(preparation and neutralization of, with caustic soda and paraformaldehyde)

L32 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1987:213943 HCAPLUS
DOCUMENT NUMBER: 106:213943
TITLE: Herbicidal 2-(2-imidazolin-2-yl)pyridine derivatives
INVENTOR(S): Los, Marinus
PATENT ASSIGNEE(S): American Cyanamid Co., USA
SOURCE: Brit. UK Pat. Appl., 361 pp.
CODEN: BAXXDU
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
GB 2174395	A1	19861105	GB 1986-11303	19860509

PRIORITY APPLN. INFO.: GB 1986-11303 19860509
OTHER SOURCE(S): CASREACT 106:213943
GI



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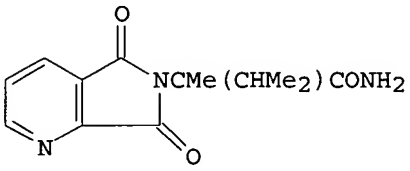

II

AB The title compds. [I; R1 = C1-4 alkyl; R2 = C1-4 alkyl, C3-6 cycloalkyl; R1R2 = (Me-substituted) C2-5 alkylene; R3 = (un)modified CO2H, acyl, HOCH2, carboxyalkyl, oxazolidinyl, (substituted) alkenyl, alkynyl, cycloalkyl, etc; R4 = H, halo, OH, Me; R5, R6 = H, halo, (substituted) C1-6 alkyl, hydroxyalkyl, C1-6 alkoxy, C1-4 alkylthio, PhO, NO2, cyano, amino; R5R6 = atoms to complete a fused, (un)subst. aromatic ring; R7 = H, (substituted) acyl, sulfonyl; X = O, S] and related compds. were prepared as herbicides. Thus, pyrrolopyridineacetamide II was treated successively with diazabicycloundcene and MeOH to give I (R1 = Me, R2 = Me2CH, R3 = CO2Me, R4-R7 = H, X = O). This was saponified and treated with Et3N to give I.Et3N (R1 = Me, R2 = Me2CH, R3 = CO2H, R4-R7 = H, X = O) (III). At 0.032 kg/ha III gave a complete kill of quackgrass.

IT **90376-86-6P 90376-87-7P 90376-88-8P**
92513-41-2P 92513-42-3P 92513-43-4P
92513-44-5P 92513-45-6P 92513-46-7P
92513-47-8P 92513-48-9P 92513-49-0P
92513-50-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and conversion to anhydride)

IT **39633-01-7P 90376-89-9P 90376-90-2P**
90376-91-3P 90376-92-4P 90376-93-5P
90376-94-6P 90376-95-7P 90376-96-8P
107504-15-4P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and dehydration of, **quinolinic** anhydride derivative by)

IT **39632-98-9P 82132-56-7P 92487-60-0P**
92487-61-1P 92487-62-2P 92487-63-3P
92487-64-4P 107504-14-3P 107504-25-6P
107504-26-7P 107504-27-8P 107504-28-9P
107504-29-0P 107504-30-3P 107504-31-4P
107504-32-5P 107504-33-6P 107504-34-7P
107504-35-8P 107504-36-9P 107504-37-0P
107504-38-1P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and saponification of)

IT **7440-50-8DP**, complexes with 2-(5-isopropyl-5-methyl-4-oxo-2-imidazolin-2-yl)nicotinate
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic

preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(preparation of, as herbicide)

L32 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1986:90951 HCAPLUS
DOCUMENT NUMBER: 104:90951
TITLE: **Quinolinic** acid
INVENTOR(S): Rebhahn, Robert W. J.; Kassner, James E.; Werner, Raymond E.
PATENT ASSIGNEE(S): Hilton-Davis Chemical Co., USA
SOURCE: U.S., 9 pp. Cont. of U.S. Ser. No. 261,254 abandoned.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4537971	A	19850827	US 1983-536133	19830926

PRIORITY APPLN. INFO.: US 1981-261254 19810506
OTHER SOURCE(S): CASREACT 104:90951

103

AB **Quinolinic** acid is manufactured by controlled oxidation of **quinoline** with H2O2 in the presence of H2SO4 and CuSO4, treatment of the **Cu quinolinate** with alkali to form CuO precipitate and the soluble alkali metal **quinolinate**, and treatment with acid to form the title compound In the initial step, the reactants are added in 15-25 portions at intervals to allow the H2O2 to react before the next addition of reactants (i.e., to maintain the concentration of unreacted H2O2 at 3-15%). In the initial step, 4-15 parts water/part **quinoline** is present in the reaction medium.

IT **89-00-9P**
RL: PREP (Preparation)
(manufacture of, by oxidation of **quinoline**, slow addition of reactants in)

IT **91-22-5**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, to **quinolinic** acid, slow addition of reactants in)

L32 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1985:471194 HCAPLUS
DOCUMENT NUMBER: 103:71194
TITLE: **Quinolinic** acid
INVENTOR(S): Mathiaparanam, Ponnampalam
PATENT ASSIGNEE(S): Appleton Papers, Inc., USA
SOURCE: Eur. Pat. Appl., 16 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

uses RU instead of cooper

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 135328	A1	19850327		
EP 135328	B1	19870225		
R: AT, BE, CH, DE, FR, GB, IT, LI, NL, SE				
US 4736036	A	19880405	US 1983-521211	19830808
CA 1254898	A1	19890530	CA 1984-460211	19840802
AT 25518	E	19870315	AT 1984-305273	19840803
JP 60084270	A2	19850513	JP 1984-165556	19840807
JP 01044187	B4	19890926		

PRIORITY APPLN. INFO.: US 1983-521211 19830808
EP 1984-305273 19840803

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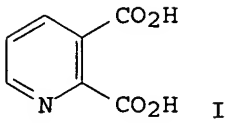


I

AB Title compound (I) was prepared by oxidizing **quinoline** with RuO4 in the presence of an aqueous solution of OCl- and sufficient addnl. base that the molar ratio of total base to **quinoline** is ≥4:1. The amount of base in the hypochlorite solns. used, typically contributed to the base to **quinoline** ratio in the range of from 0.625:1 to 1.5:1. Thus, a mixture of 5.2 g **quinoline**, 0.01 g RuCl3.3H2O, and sufficient NaOH to provide a total base to **quinoline** molar ratio of 9 was stirred vigorously and sufficient NaOCl solution to provide 0.44 mol NaOCl was added. The NaOH was added in a volume of H2O determined by the difference between 350 mL and the volume of NaOCl solution used. The mixture was stirred at 50° for 20 h to give 92% I (isolated as **Cu** complex).

IT **89-00-9P**
RL: PREP (Preparation)
(manufacture of, by ruthenium-catalyzed oxidation of **quinoline** by hypochlorite in presence of base)

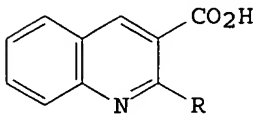
IT **91-22-5**, uses and miscellaneous
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, ruthenium-catalyzed, to **quinolinic** acid)

L32 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1985:113321 HCAPLUS
DOCUMENT NUMBER: 102:113321
TITLE: Oxidation of alkyl groups to carboxyl groups under basic conditions
PATENT ASSIGNEE(S): American Cyanamid Co., USA
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 59199637	A2	19841112	JP 1984-75903	19840417
JP 05082372	B4	19931118		
US 4623726	A	19861118	US 1983-485769	19830418
EP 126893	A1	19841205	EP 1984-103414	19840328
EP 126893	B1	19890621		
R: BE, CH, DE, FR, GB, IT, LI, NL, SE				
IN 162865	A	19880716	IN 1984-CA211	19840330
IL 71466	A1	19891215	IL 1984-71466	19840408
ES 531657	A1	19850801	ES 1984-531657	19840416
CA 1261845	A1	19890926	CA 1984-452079	19840416
DK 8401980	A	19841019	DK 1984-1980	19840417
DK 168211	B1	19940228		
AU 8426897	A1	19841025	AU 1984-26897	19840417
AU 566449	B2	19871022		
BR 8401813	A	19841127	BR 1984-1813	19840417
ZA 8402889	A	19841128	ZA 1984-2889	19840417

HU 36771	A2	19851028	HU 1984-1499	19840418
HU 200980	B	19900928		
US 4750978	A	19880614	US 1986-900462	19860825
DK 9300740	A	19930622	DK 1993-740	19930622
DK 168623	B1	19940509		
DK 9300741	A	19930622	DK 1993-741	19930622
DK 170154	B1	19950606		

PRIORITY APPLN. INFO.: US 1983-485769 19830418
OTHER SOURCE(S): CASREACT 102:113321
GI



I

NO

AB Alkyl groups were oxidized by MmOn (M = **Cu**, Co, Ag; m = 1, 2; n = 2-6) at 25-95° under basic conditions. Thus, 20 mL 15% NaOCl was added to a solution of CuO 3.8, H2O 7.5, 50% aqueous NaOH 3, and **quinoline** derivative (I; R = Me) 1.0 g at 70° and stirred 18 h to give 92% dicarboxylic acid I (R = HO2C).

IT **89-00-9P 643-38-9P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

L32 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1982:576891 HCAPLUS
DOCUMENT NUMBER: 97:176891
TITLE: Complex formation of picloram and related chemicals with metal ions
AUTHOR(S): Chang, I. K.; Foy, C. L.
CORPORATE SOURCE: Dep. Plant Pathol. Physiol., Virginia Polytech. Inst. and State Univ., Blacksburg, VA, 24061, USA
SOURCE: Pesticide Biochemistry and Physiology (1982), 18(2), 141-9
CODEN: PCBPBS; ISSN: 0048-3575
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The complex formation of metal ions with pyridine carboxylic acids was estimated with polarog. and spectrophotometry. picloram [1918-02-1], α-picolinic acid [98-98-6], fusaric acid [536-69-6], dipicolinic acid [499-83-2], And **quinolinic** acid [89-00-9] formed complexes with Fe(III) or **Cu**(II) whose coordination involves, most probably, a lone pair of electrons of pyridine N and a carboxylic group. Picloram-metal complexes were, however, estimated to be relatively unstable compared to other pyridine α-carboxylic acids tested. Effects of pyridine carboxylic acids on oxidation of indole-3-acetic acid [87-51-4] were tested in vitro in a horseradish protoheme peroxidase system. No significant effect on the pyridine carboxylic acids was observed at 2 + 10-4M. Also, no concentration effect of picloram (10-5 to 3 + 10-3 M) was obtained. The phytotoxic action of picloram may not result from the depletion of free metal ions in plants nor inhibition of activity of metal-containing enzymes through strong chelation as hypothesized. Auxin activity of picloram should be explained in other ways.

IT **89-00-9DP**, **copper** complexes
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and properties of, herbicidal action mechanism in relation to)

L32 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1982:6597 HCAPLUS
DOCUMENT NUMBER: 96:6597
TITLE: **Copper quinolinate**
INVENTOR(S): Hatano, Yoshihiro; Ikegami, Seishi
PATENT ASSIGNEE(S): Yamamoto Synthetic Chemical Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 15 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 34943	A2	19810902	EP 1981-300755	19810224
EP 34943	A3	19810923		
EP 34943	B1	19830713		
R: BE, CH, DE, FR, GB, IT				
JP 56118067	A2	19810916	JP 1980-21623	19800225
JP 63047708	B4	19880926		
US 4420616	A	19831213	US 1981-236945	19810220

PRIORITY APPLN. INFO.: JP 1980-21623 19800225

AB **Cu quinolinate** (2:1) (I) was prepared by oxidizing **quinoline** with H2O2 in the presence of CuSO4 at ≤400 mm Hg. Thus, oxidation of **quinoline** with H2O2 in the presence of H2SO4 and CuO at 70-5° and 150-400 mmHg gave 66% I. Treatment of aqueous I with H2S gave 87.9% **quinolinic** acid.

IT **91-22-5**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of)

IT **89-00-9P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

L32 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1981:110102 HCAPLUS
DOCUMENT NUMBER: 94:110102
TITLE: Interaction of **copper** with **quinolinate** ions at the dropping mercury electrode
AUTHOR(S): Basin, S. K.; Parkash, Om; Gaur, J. N.; Jain, D. S.
CORPORATE SOURCE: Univ. Rajastan, Jaipur, 302 004, India
SOURCE: Journal of the Electrochemical Society of India (1979), 28(2), 103-5
CODEN: JESIA5; ISSN: 0013-466X
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A polarog. study of **Cu**(II) in the presence of **quinolinate** ions was carried out at constant ionic strength (μ = 1.5). The reduction of **Cu**(II) is diffusion-controlled, but not reversible. In order to calculate composition and formation consts. of the complexes formed by the De Ford and Hume method, the reversible half wave potentials, E1/2r were evaluated by Gelling's treatment. The distribution of **Cu**(II) present in various forms was calculated The value of Ks is .apprx.10-3 cm/s, confirming the quasi-reversible nature of the electrode process.

IT **89-00-9DP**, **copper**(II) complexes **7440-50-8DP**, **quinolinic** acid complexes
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, polarog. study of)

L32 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1980:136247 HCAPLUS
DOCUMENT NUMBER: 92:136247
TITLE: Potentiometric study of mixed ligand chelates of **copper**(II) with **quinolinic** acid as primary ligand and glycine, α-alanine and valine as secondary ligands
AUTHOR(S): Sawhney, M. P.; Joshi, D. P.; Sharma, K. N.; Jain, P. K.
CORPORATE SOURCE: Chem. Dep., Dayanand Anglo-Vedic Coll., Muzaffarnagar, India
SOURCE: Indian Journal of Chemistry, Section A: Inorganic, Physical, Theoretical & Analytical (1980), 19A(1), 85-7
CODEN: IJCADU; ISSN: 0376-4710
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Mixed ligand chelates of **Cu**(II) with **quinolinic** acid (QLA) as the primary ligand (H2A) and glycine, α-alanine or valine as the secondary ligand (HB) were studied by potentiometry. The results show that a 1:1 **Cu**(II)-**quinolinic** acid chelate is formed at lower pH and it combines with glycine, α-alanine or valine at higher pH to form mixed ligand chelate of 1:1:1 stoichiometry. The stability sequence with respect to secondary ligand is glycine > α-alanine > valine.

IT **89-00-9DP**, **copper** complexes **7440-50-8DP**, amino acid-**quinolinate** acid mixed complexes
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of)

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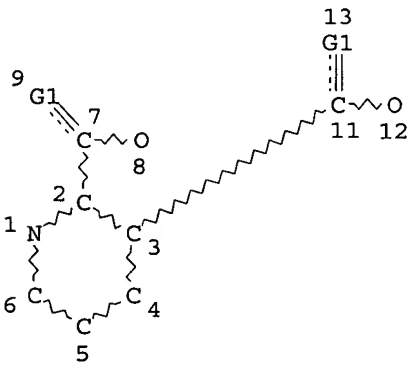
L3 STR



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DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 12

STEREO ATTRIBUTES: NONE
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L12 1 SEA FILE=REGISTRY ABB=ON PLU=ON QUINOLINE/CN

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L13          67 SEA FILE=REGISTRY ABB=ON  PLU=ON  8-HYDROXYQUINOLIN?/CN
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L15       87365 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 OR L13 OR QUINOLIN? OR
                 HYDROXYQUINOLIN?
L17         760 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L11/P
L18         249 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 AND L15
L20           5 SEA FILE=REGISTRY ABB=ON  PLU=ON  COPPER/CN OR ("COPPER
                 (CU21+)"/CN OR "COPPER (CU31+)"/CN OR "COPPER (CU4)"/CN OR
                 "COPPER (CU6) CLUSTER"/CN)
L22       10886 SEA FILE=REGISTRY ABB=ON  PLU=ON  METAL
L23         280 SEA FILE=REGISTRY ABB=ON  PLU=ON  MINERAL
L24     1104580 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 OR COPPER OR CU
L27     3458592 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 OR METAL
L28      997769 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 OR MINERAL
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L30           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND L24 AND L27 AND L28
L31          15 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND L24
L32          14 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L31 NOT L30
L39          10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L14 AND L24 AND L27 AND L28)
                 NOT (L29 OR L32)


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L39  ANSWER 1 OF 10  HCAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:         2004:450566  HCAPLUS
DOCUMENT NUMBER:          141:23425
TITLE:                    Procedure for the removal of heavy metal
                          impurities and the production of highly pure
                          2,3-pyridinedicarboxylic acid
INVENTOR(S):              Sato, Toshio
PATENT ASSIGNEE(S):       Sumikin Air Water Chemical Inc., Japan; Hebei Sinochem
                          Fuheng Co., Ltd.
SOURCE:                   Ger. Offen., 9 pp.
                          CODEN: GWXXBX
DOCUMENT TYPE:            Patent
LANGUAGE:                 German
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.        KIND  DATE           APPLICATION NO.  DATE
     ---------------   ----  --------       ---------------  --------
     DE 10341864        A1   20040603       DE 2003-10341864 20030909
     JP 2004155725      A2   20040603       JP 2002-323941   20021107
PRIORITY APPLN. INFO.:                   JP 2002-323941   A  20021107
AB   A procedure for the production of 2,3-pyridinedicarboxylic acid (I) with a
     substantially lower heavy metal content, which can meet the
     purity level demanded for medical and agricultural chems., is prepared by:
     adding a S-containing substance selected from hydrosulfides, sulfides,
     polysulfides, and sulfur, to an aqueous solution of the impure I or a salt of it;
     removing the resulting precipitation from the solution; acidifying the solution with
a
     mineral acid for the precipitation of pure I; and recovering the I precipitate
     (i.e., by filtration).  The aqueous solution which can be treated can be an aqueous
     solution of an alkali metal salt of I, which is obtained by the
     alkaline decomposition of I-Cu(II) salt.
IT   7439-89-6, Iron, reactions 7440-50-8, Copper,
     reactions
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RL: REM (Removal or disposal); RGT (Reagent); PROC (Process); RACT (Reactant or reagent)
(in a procedure for the removal of heavy **metal** impurities and the production of highly pure 2,3-pyridinedicarboxylic acid)

IT **89-00-9P**, 2,3-Pyridinedicarboxylic acid
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); PREP (Preparation); PROC (Process)
(procedure for the removal of heavy **metal** impurities and the production of highly pure 2,3-pyridinedicarboxylic acid)

L39 ANSWER 2 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:249589 HCAPLUS
DOCUMENT NUMBER: 140:270746
TITLE: Method for purification of heterocycle dicarboxylic acid
INVENTOR(S): Sato, Toshio; Namekata, Takeshi
PATENT ASSIGNEE(S): Sumikin Air Water Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004091416	A2	20040325	JP 2002-256665	20020902

PRIORITY APPLN. INFO.: JP 2002-256665 20020902
OTHER SOURCE(S): CASREACT 140:270746

AB A method for purification of heterocycle dicarboxylic acid, in particular pyridine-2,3-dicarboxylic acid (I), comprises preparing a solution of pyridine-2,3-dicarboxylic acid ammonium or amine salt, adding **mineral** acid to the solution for precipitating I, separation the precipitated I, suspending the separated I in water, and filtration. This process efficiently reduces the content of alkali **metal** (.apprx.1,000 mg/kg) and heavy **metal** (50-100 mg/kg) in I to ≤20 mg/kg alkali **metal** and <1 mg/kg heavy **metal** (e.g. Ni, Fe, or **Cu**) after acid precipitation and further down to <1 mg/kg alkali **metal** after suspension in water and filtration. It gives I of high purity which is acceptable for the use as electronic material. Thus, com. available industrial 322 g I containing Na 870, Fe 19, Ni 7, and **Cu** 59 mg/kg was dissolved in 272 g 25% aqueous NH3 and 1,000 g deionized H2O and filtered to give a slightly yellowish solution of I ammonium salt which was treated with 425 g 35% HCl for acid precipitation of I and filtered to give, after washing with 300 g deionized H2O and drying 302 g I containing Na 13, Fe <1, Ni <1, and **Cu** <1 mg/kg. The purified I (150 g) was suspended in 500 g deionized H2O, filtered, and washed with 150 g H2O to give 140 g I containing Na 9, Fe <1, Ni <1, and **Cu** <1 mg/kg.

IT **190905-92-1P**
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(purification of heterocycle dicarboxylic acid, in particular pyridine-2,3-dicarboxylic acid, by acid precipitation, suspension in water and filtration to remove alkali and heavy **metals**)

IT **89-00-9P**, Pyridine-2,3-dicarboxylic acid
RL: PUR (Purification or recovery); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(purification of heterocycle dicarboxylic acid, in particular pyridine-2,3-dicarboxylic acid, by acid precipitation, suspension in water and filtration to remove alkali and heavy **metals**)

IT **7439-89-6**, Iron, processes **7440-02-0**, Nickel, processes

7440-23-5, Sodium, processes **7440-50-8**, **Copper**
, processes
RL: REM (Removal or disposal); PROC (Process)
(purification of heterocycle dicarboxylic acid, in particular pyridine-2,3-dicarboxylic acid, by acid precipitation, suspension in water and filtration to remove alkali and heavy **metals**)

L39 ANSWER 3 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:120922 HCAPLUS
DOCUMENT NUMBER: 140:173472
TITLE: Process for reducing dishing and erosion during chemical mechanical planarization
INVENTOR(S): Hellring, Stuart D.; Li, Yuzhuo; Auger, Robert L.
PATENT ASSIGNEE(S): PPG Industries Ohio, Inc., USA
SOURCE: PCT Int. Appl., 31 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004013242	A2	20040212	WO 2003-US24286	20030801
WO 2004013242	A3	20040603		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

US 2004077295	A1	20040422	US 2003-627775	20030728

PRIORITY APPLN. INFO.: US 2002-401109P P 20020805
US 2003-627775 A 20030728

AB This invention is directed to a slurry system and process of **metal** removal from a substrate. This invention is useful for polishing a microelectronic device. This invention is especially useful for chemical mech. planarization of a semiconductor wafer. The slurry system of the present invention includes a first slurry and a second slurry, wherein the first slurry has a higher abrasive concentration than the second slurry. The process of the present invention includes a first polish with the first slurry to partially remove **metal** from the substrate, and a second polish with the second slurry to further remove **metal** from the substrate.

IT **1344-28-1**, Alumina, uses **7631-86-9**, Silica, uses **13463-67-7**, Titania, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(abrasive for CMP slurry; process for reducing dishing and erosion during chemical mech. planarization)

IT **89-00-9**, Quinolinic acid
RL: MOA (Modifier or additive use); USES (Uses)
(process for reducing dishing and erosion during chemical mech. planarization)

IT **7440-50-8**, **Copper**, miscellaneous
RL: MSC (Miscellaneous)
(removal of; process for reducing dishing and erosion during chemical mech. planarization)

L39 ANSWER 4 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:53257 HCAPLUS
DOCUMENT NUMBER: 140:103323
TITLE: Polishing slurries for **copper** type **metals** and manufacture of semiconductor devices
INVENTOR(S): Kobayashi, Nobuo; Nonaka, Mikio; Yamauchi, Katsuhiko
PATENT ASSIGNEE(S): Shibaura Mechatronics Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004023068	A2	20040122	JP 2002-180227	20020620

PRIORITY APPLN. INFO.: JP 2002-180227 20020620

AB The slurries contain an aqueous organic acid which forms a complex by reacting with **Cu**, alumina abrasive particles, and polyacrylalkyloxide having weight average mol. weight 10,000-8,000,000, where the content(weight%) of the polyacrylalkyloxide is calculated from 3146.9 + A-0.6169 (A is the weight average mol. weight). Preferably, the alumina is colloidal alumina and/or θ-alumina. The semiconductor devices are manufactured by: forming grooves for embeding circuit part, forming **Cu** or **Cu** alloy circuit material membrane on the insulation membrane containing the grooves, and chemical-mech polishing the circuit membrane by using the slurry.

IT **1344-28-1**, Alumina, uses
RL: NUU (Other use, unclassified); USES (Uses)
(abrasives; polishing slurries for **copper** type **metals** and manufacture of semiconductor devices)

IT **7631-86-9**, Silica, uses
RL: DEV (Device component use); USES (Uses)
(insulation membrane; polishing slurries for **copper** type **metals** and manufacture of semiconductor devices)

IT **7440-50-8**, **Copper**, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(polishing slurries for **copper** type **metals** and manufacture of semiconductor devices)

IT **89-00-9**, Quinolinic acid
RL: NUU (Other use, unclassified); USES (Uses)
(slurries containing; polishing slurries for **copper** type **metals** and manufacture of semiconductor devices)

L39 ANSWER 5 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:737002 HCAPLUS
DOCUMENT NUMBER: 139:264411
TITLE: Activated abrasive polishing slurry for aluminum-based films for manufacturing semiconductor devices
INVENTOR(S): Matsui, Yukiteru; Minamihaba, Gaku
PATENT ASSIGNEE(S): Kabushiki Kaisha Toshiba, Japan
SOURCE: U.S. Pat. Appl. Publ., 10 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003173329	A1	20030918	US 2003-378994	20030305
JP 2003264161	A2	20030919	JP 2002-64210	20020308

PRIORITY APPLN. INFO.: JP 2002-64210 A 20020308

AB A polishing slurry for an aluminum-based **metal** includes an oxidizing agent having a standard electrode potential of ≥1.7 V, amino acid or amino acid compound, and bi- or higher than bi-valent aromatic carboxylic acid having a carbocycle or a heterocycle. The amino acid is at least one compound selected from glycine, alanine and phenylalanine which is incorporated in the polishing slurry at a concentration ranging of 0.1-5 weight%. He oxidizing agent is a compound selected from ammonium persulfate, ozone, and hydrogen peroxide included in the polishing slurry at a concentration of 0.1-5 weight%. Said bivalent aromatic carboxylic acid included in the polishing slurry at a concentration of 0.1-1 weight% is selected from phthalic acid, trimellitic acid, pyromellitic acid, quinolinic acid, nicotinic acid, pyridine-2,3,4-dicarboxylic acid, and cinchomeronic acid. The polishing slurry further comprises polishing particles selected from silica, alumina, zirconia, and ceria.

IT **1344-28-1**, Alumina, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(abrasive particles; activated abrasive polishing slurry for aluminum-based films for manufacturing semiconductor devices)

IT **7631-86-9**, Silica, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(abrasive particles; activated abrasive polishing slurry for aluminum-based films for manufacturing semiconductor devices)

IT **89-00-9**, Quinolinic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(component of polishing slurry; activated abrasive polishing slurry for aluminum-based films for manufacturing semiconductor devices)

IT **7440-32-6**, Titanium, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(liner film; activated abrasive polishing slurry for aluminum-based films for manufacturing semiconductor devices)

L39 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:512035 HCAPLUS
DOCUMENT NUMBER: 139:61507
TITLE: Polishing slurry for chemical-mechanical polishing of silicon carbide series compound film and polishing method in semiconductor device fabrication
INVENTOR(S): Minamihaba, Gaku; Yano, Hiroyuki; Kurashima, Nobuyuki
PATENT ASSIGNEE(S): Kabushiki Kaisha Toshiba, Japan
SOURCE: U.S. Pat. Appl. Publ., 9 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003124850	A1	20030703	US 2002-326407	20021223
JP 2003197574	A2	20030711	JP 2001-398479	20011227

PRIORITY APPLN. INFO.: JP 2001-398479 A 20011227

AB A polishing slurry for chemical-mech. polishing (CMP) of SiC series compound (e.g., SiCO, etc.) film, includes colloidal silica having a primary

particle diameter of 5-30 nm, and ≥ 1 acid selected from the group consisting of an amino acid having a benzene ring (e.g., phenylalanine, etc.) and an organic acid having a heterocyclic ring (e.g., quinaldinic acid, etc.).

IT **7631-86-9**, Silica, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(colloidal, polishing slurry containing; polishing slurry for chemical-mech. polishing of silicon carbide series compound film and polishing method in semiconductor device fabrication)

IT **7440-33-7**, Tungsten, processes **7440-50-8**, **Copper**, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(polishing of; polishing slurry for chemical-mech. polishing of silicon carbide series compound film and polishing method in semiconductor device fabrication)

IT **89-00-9**, Quinolinic acid
RL: NUU (Other use, unclassified); USES (Uses)
(polishing slurry containing; polishing slurry for chemical-mech. polishing of silicon carbide series compound film and polishing method in semiconductor device fabrication)

L39 ANSWER 7 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:435266 HCAPLUS
DOCUMENT NUMBER: 138:410670
TITLE: Design of a slurry for chemical-mechanical polishing of a **copper** layer in a semiconductor device
INVENTOR(S): Minamihaba, Gaku; Yano, Hiroyuki
PATENT ASSIGNEE(S): Kabushiki Kaisha Toshiba, Japan
SOURCE: U.S. Pat. Appl. Publ., 10 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003104699	A1	20030605	US 2002-303855	20021126
US 6720250	B2	20040413		

PRIORITY APPLN. INFO.: JP 2001-366938 A 20011130

AB The invention relates to the design of a slurry for chemical-mech. polishing (CMP) of a **copper** layer in a semiconductor device. The polishing slurry for CMP of **Cu** consists of (i) a first complexing agent containing a heterocyclic compound which is capable of forming a water-insol. complex with **Cu**; and (ii) a second complexing agent containing a heterocyclic compound which is capable of forming a slightly water-soluble or water-soluble complex with **Cu** to thereby provide at least one extra ligand subsequent to formation of the complex.

IT **1344-28-1**, Alumina, uses **7631-86-9**, Silica, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(abrasive; design of a slurry for chemical-mech. polishing of a **copper** layer in a semiconductor device)

IT **89-00-9**, Quinolinic acid **632-95-1**, Pyridine-2,3,4-tricarboxylic acid
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(complexing agent; design of a slurry for chemical-mech. polishing of a **copper** layer in a semiconductor device)

IT **7440-50-8**, **Copper**, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES

(Uses)
(polished surface; design of a slurry for chemical-mech. polishing of a **copper** layer in a semiconductor device)

L39 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:167514 HCAPLUS
DOCUMENT NUMBER: 138:196967
TITLE: Chemical mechanical polishing method for noble **metals**
INVENTOR(S): Brusic, Vlasta; De Rege, Francesco M.; Moeggenborg, Kevin J.; Cherian, Isaac K.; Zhou, Renjie
PATENT ASSIGNEE(S): Cabot Microelectronics Corporation, USA
SOURCE: U.S., 12 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6527622	B1	20030304	US 2002-54059	20020122

PRIORITY APPLN. INFO.: US 2002-54059 20020122

AB The invention provides a method of polishing a substrate comprising a noble **metal** comprising (1) contacting the substrate with a CMP system and (2) abrading at least a portion of the substrate to polish the substrate. The CMP systems each comprise an abrasive and/or polishing pad, a liquid carrier, and optionally one or more polishing additives. In a 1st embodiment, the polishing additives are selected from the group consisting of diketones, diketonates, heterocyclic N-containing compds., heterocyclic O-containing compds., heterocyclic P-containing compds., urea compds., N-containing compds. that can be zwitterionic compds., salts thereof, and combinations thereof. In a 2nd embodiment, the polishing additive is a **metal** compound with ≥2 oxidation states and is used in conjunction with a peroxy-type oxidizer. In a 3rd embodiment, the CMP system comprises α-Al2O3 and fumed Al2O3, in which the weight ratio of α-Al2O3 to fumed Al2O3 is .apprx.0.6:1 to .apprx.9:1.

IT **7631-86-9**, Silica, processes **7782-40-3**, Diamond, processes **13463-67-7**, Titania, processes
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(polishing abrasive; chemical mech. polishing method for noble **metals**)

IT **7440-05-3**, Palladium, processes **7440-22-4**, Silver, processes **7440-57-5**, Gold, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(polishing of; chemical mech. polishing method for noble **metals**)

IT **7440-06-4**, Platinum, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polishing of; chemical mech. polishing method for noble **metals**)

IT **89-00-9**, 2,3-Pyridine dicarboxylic acid **1344-28-1**, α-Alumina, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(polishing slurry containing; chemical mech. polishing method for noble **metals**)

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L39 ANSWER 9 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:193478 HCAPLUS
DOCUMENT NUMBER: 136:240046
TITLE: Detection of termination of chemical mechanical polishing and aqueous polishing dispersion for the method
INVENTOR(S): Hattori, Masayuki; Kawahashi, Nobuo
PATENT ASSIGNEE(S): JSR Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002075939	A2	20020315	JP 2000-261716	20000830

PRIORITY APPLN. INFO.: JP 2000-261716 20000830

AB Termination of chemical mech. polishing, which is carried out in fabrication of semiconductor devices, e.g. damascene process, shallow trench isolation, etc., is detected by color change of aqueous polishing dispersion containing coloring agents on a polishing pad or of the waste polishing solution The termination of the polishing process is much precisely detected without etching, thinning, dishing, scratching, etc.

IT **7631-86-9**, Aerosil 50, uses
RL: NUU (Other use, unclassified); USES (Uses)
(abrasive grain; detection of termination of chemical mech. polishing and aqueous polishing dispersion for the method)

IT **89-00-9**, Quinolinic acid
RL: MOA (Modifier or additive use); USES (Uses)
(coloring agent; detection of termination of chemical mech. polishing and aqueous polishing dispersion for the method)

IT **7429-90-5**, Aluminum, processes **7440-33-7**, Tungsten, processes **7440-50-8**, **Copper**, processes
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(detection of termination of chemical mech. polishing and aqueous polishing dispersion for the method)

L39 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1951:26568 HCAPLUS
DOCUMENT NUMBER: 45:26568
ORIGINAL REFERENCE NO.: 45:4606d-e
TITLE: Analysis by permanganate titrations of 8-quinolinols
AUTHOR(S): Phillips, John P.; O'Hara, F. J.
CORPORATE SOURCE: Univ. of Louisville, KY
SOURCE: Anal. Chem. (1951), 23, 535-6
CODEN: ANCHAM; ISSN: 0003-2700
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable

AB KMnO4 treatment of 8-quinolinol or 8-hydroxyquinaldine serves to convert the former into 2,3-C5H3N(CO2H)2 and the latter into 2,3,6-C5H2N(CO2H)2Me. In both cases 5 moles react with 16 moles of KMnO4. If the excess of KMnO4 is small and the reaction is not prolonged, titration of excess KMnO4 by the iodometric reaction gives satisfactory results. The procedure can be used for determining cations, such as **Cu** or Mg, that are precipitated by 8-quinolinol or 8-hydroxyquinaldine. The results are better with the latter reagent.

IT **7440-50-8**, **Copper**
(analysis, determination)

IT **89-00-9**, Quinolinic acid

(formation of)
IT **7722-64-7**, Potassium permanganate
(reaction of, with 8-hydroxy-quinaldine and 8-quinolinol)

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E1 THROUGH E58 ASSIGNED

=> select hit rn l39 1-10
E59 THROUGH E77 ASSIGNED

=> fil hcaplus
FILE 'HCAPLUS' ENTERED AT 14:44:40 ON 23 JUL 2004
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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FILE COVERS 1907 - 23 Jul 2004 VOL 141 ISS 5
FILE LAST UPDATED: 22 Jul 2004 (20040722/ED)

This file contains CAS Registry Numbers for easy and accurate
substance identification.

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L41 58 S L40 AND L11

=> d his l40-l41

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FILE 'REGISTRY' ENTERED AT 14:44:55 ON 23 JUL 2004
L40 75 S E1-E77
L41 58 S L40 AND L11

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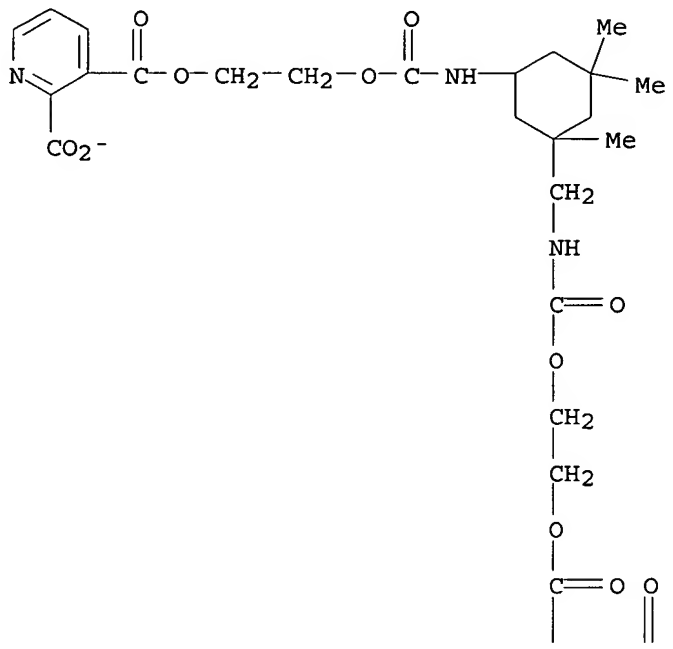
L41 ANSWER 1 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **233691-44-6** REGISTRY
CN Copper, [3-[2-[[[[[5-[[[2-[[(2-carboxy-3-pyridinyl)carbonyl]oxy]ethoxy]car
bonyl]amino]-1,3,3-trimethylcyclohexyl]methyl]amino]carbonyl]oxy]ethyl]
2,3-pyridinedicarboxylato(2-)-κN1,κO2]- (9CI) (CA INDEX NAME)

MF C30 H34 Cu N4 O12
CI CCS
SR CA
LC STN Files: CA, CAPLUS
DT.CA CAplus document type: Journal
RL.NP Roles from non-patents: PREP (Preparation); PRP (Properties); RACT (Reactant or reagent)

PAGE 1-A



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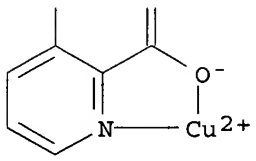


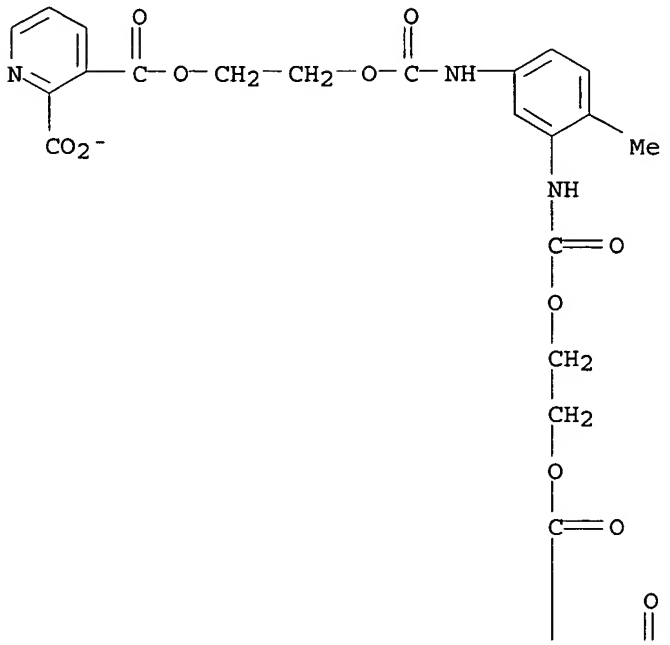
1 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 131:138396

L41 ANSWER 2 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **233691-43-5** REGISTRY
CN Copper, [3-[2-[[[[5-[[[2-[[(2-carboxy-3-pyridinyl)carbonyl]oxy]ethoxy]carbonyl]amino]-2-methylphenyl]amino]carbonyl]oxy]ethyl] 2,3-pyridinedicarboxylato(2-)-κN1,κO2]- (9CI) (CA INDEX NAME)
MF C27 H22 Cu N4 O12
CI CCS
SR CA
LC STN Files: CA, CAPLUS

DT.CA CAplus document type: Journal
RL.NP Roles from non-patents: PREP (Preparation); PRP (Properties); RACT (Reactant or reagent)

PAGE 1-A



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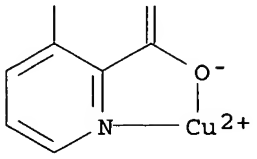
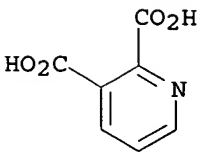


1 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 131:138396

L41 ANSWER 3 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **190905-92-1** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, diammonium salt (9CI) (CA INDEX NAME)
OTHER NAMES:
CN Diammonium pyridine-2,3-dicarboxylate
MF C7 H5 N O4 . 2 H3 N
SR CA
LC STN Files: CA, CAPLUS, CASREACT, TOXCENTER
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: RACT (Reactant or reagent)
CRN (89-00-9)



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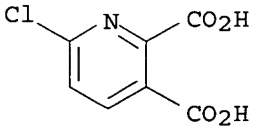
2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:270746

REFERENCE 2: 127:59737

L41 ANSWER 4 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **127437-44-9** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-chloro- (9CI) (CA INDEX NAME)
OTHER NAMES:
CN 6-Chloropyridine-2,3-dicarboxylic acid
FS 3D CONCORD
MF C7 H4 Cl N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 139:52912

REFERENCE 2: 137:263078

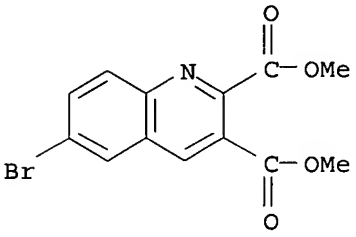
REFERENCE 3: 136:325398

REFERENCE 4: 130:139260

REFERENCE 5: 113:6374

L41 ANSWER 5 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-38-1** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-bromo-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD

MF C13 H10 Br N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, TOXCENTER, USPATFULL
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 129:260415

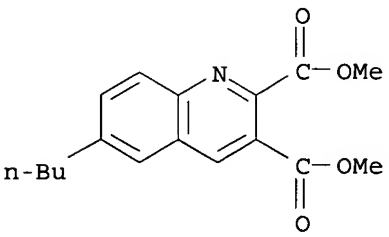
REFERENCE 2: 128:154091

REFERENCE 3: 113:115107

REFERENCE 4: 107:134222

REFERENCE 5: 106:213943

L41 ANSWER 6 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-37-0** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-butyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C17 H19 N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

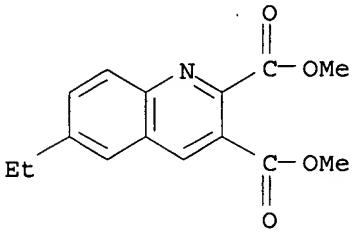
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 7 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-36-9** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-ethyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C15 H15 N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

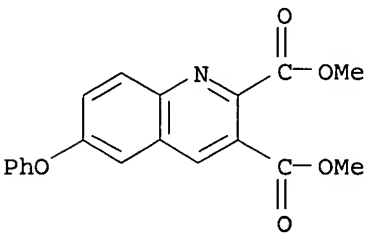
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 8 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-35-8** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-phenoxy-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C19 H15 N O5
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

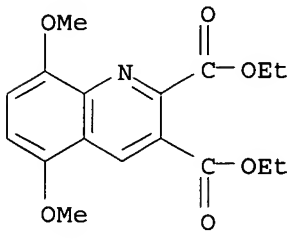
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 9 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-34-7** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 5,8-dimethoxy-, diethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C17 H19 N O6
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

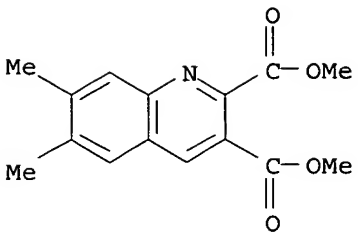
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 10 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-33-6** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6,7-dimethyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C15 H15 N O4
SR CA
LC STN Files: CA, CAPLUS, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

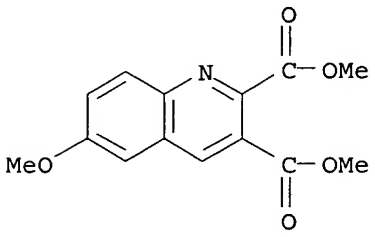
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 11 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-32-5** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-methoxy-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C14 H13 N O5
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 129:260415

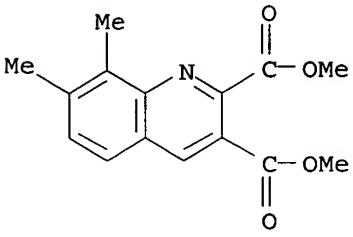
REFERENCE 2: 113:115107

REFERENCE 3: 111:232540

REFERENCE 4: 107:134222

REFERENCE 5: 106:213943

L41 ANSWER 12 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-31-4** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 7,8-dimethyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C15 H15 N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

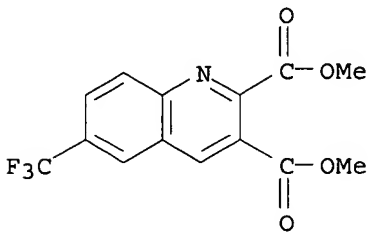
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 13 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-30-3** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-(trifluoromethyl)-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C14 H10 F3 N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

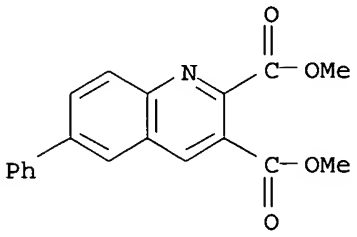
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 14 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-29-0** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-phenyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C19 H15 N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

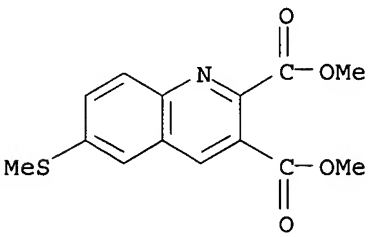
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 15 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-28-9** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-(methylthio)-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C14 H13 N O4 S
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

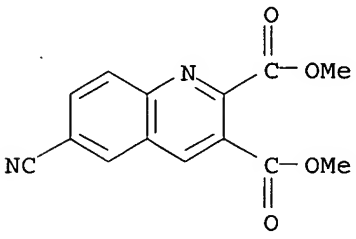
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 16 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-27-8** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-cyano-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C14 H10 N2 O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

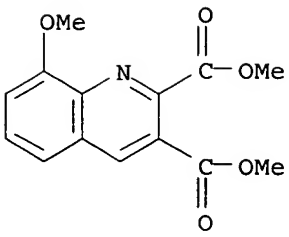
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 17 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-26-7** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 8-methoxy-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C14 H13 N O5
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

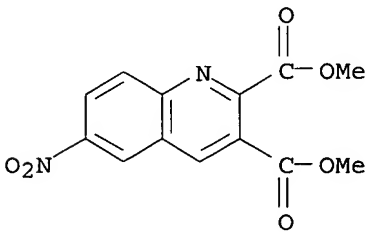
REFERENCE 1: 113:115107

REFERENCE 2: 111:232540

REFERENCE 3: 107:134222

REFERENCE 4: 106:213943

L41 ANSWER 18 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-25-6** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-nitro-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C13 H10 N2 O6
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

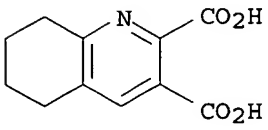
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

L41 ANSWER 19 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-15-4** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 5,6,7,8-tetrahydro- (9CI) (CA INDEX NAME)

FS 3D CONCORD
MF C11 H11 N O4
SR CA
LC STN Files: CA, CAPLUS
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



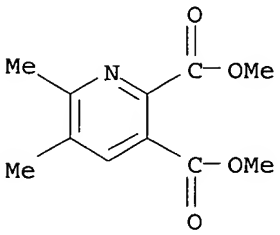
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 111:78004

REFERENCE 2: 106:213943

L41 ANSWER 20 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **107504-14-3** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 5,6-dimethyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C11 H13 N O4
SR CA
LC STN Files: CA, CAPLUS, CASREACT
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



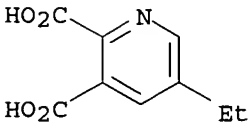
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

1 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

L41 ANSWER 21 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **102268-15-5** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 5-ethyl- (9CI) (CA INDEX NAME)
OTHER NAMES:
CN 5-Ethyl-2,3-pyridinedicarboxylic acid
CN 5-Ethylquinolinic acid
FS 3D CONCORD

MF C9 H9 N O4
CI COM
SR CA
LC STN Files: BEILSTEIN*, CA, CAPLUS, CASREACT, CHEMCATS, CHEMLIST, CSCHEM, RTECS*, TOXCENTER, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
RLD.P Roles for non-specific derivatives from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: ANST (Analytical study); PREP (Preparation); PROC (Process); PRP (Properties)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

21 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
21 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 126:350979

REFERENCE 2: 126:2963

REFERENCE 3: 125:74973

REFERENCE 4: 123:111860

REFERENCE 5: 123:47024

REFERENCE 6: 121:35349

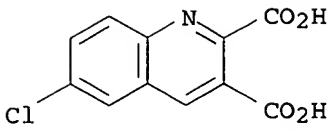
REFERENCE 7: 120:217305

REFERENCE 8: 120:163986

REFERENCE 9: 120:109592

REFERENCE 10: 120:10378

L41 ANSWER 22 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-50-3** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-chloro- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C11 H6 Cl N O4
LC STN Files: CA, CAPLUS, CASREACT, SPECINFO, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

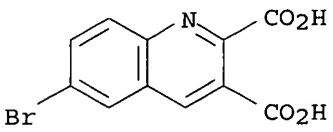
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 23 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-49-0** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-bromo- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C11 H6 Br N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

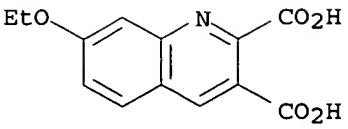
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 24 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-48-9** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 7-ethoxy- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C13 H11 N O5
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

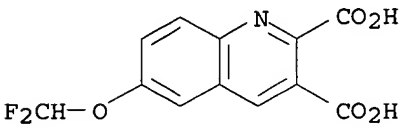
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 25 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-47-8** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-(difluoromethoxy)- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C12 H7 F2 N O5
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

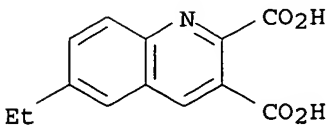
REFERENCE 3: 106:213943

REFERENCE 4: 106:50206

REFERENCE 5: 101:171123

L41 ANSWER 26 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-46-7** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-ethyl- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C13 H11 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL

DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

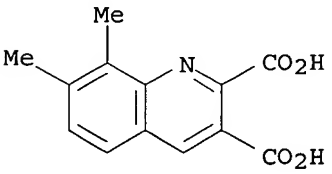
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 27 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-45-6** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 7,8-dimethyl- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C13 H11 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

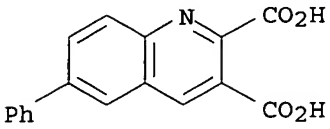
REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 28 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-44-5** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-phenyl- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C17 H11 N O4

LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

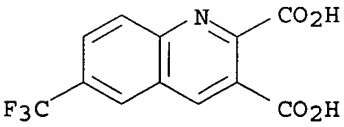
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 29 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-43-4** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-(trifluoromethyl)- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C12 H6 F3 N O4
LC STN Files: CA, CAPLUS, CASREACT, SPECINFO, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

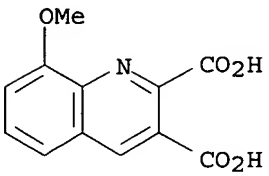
REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 30 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-42-3** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 8-methoxy- (9CI) (CA INDEX NAME)
FS 3D CONCORD

MF C12 H9 N O5
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

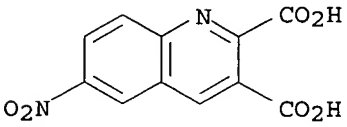
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 31 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92513-41-2** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-nitro- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C11 H6 N2 O6
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

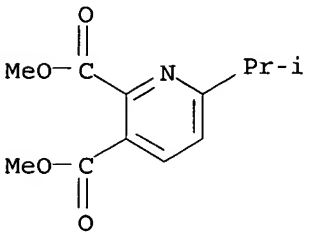
REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

L41 ANSWER 32 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92487-64-4** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-(1-methylethyl)-, dimethyl ester (9CI)

(CA INDEX NAME)
FS 3D CONCORD
MF C12 H15 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



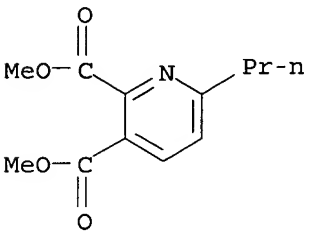
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

L41 ANSWER 33 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92487-63-3** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-propyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C12 H15 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

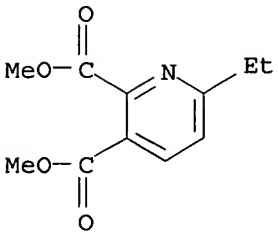
2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

L41 ANSWER 34 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92487-62-2** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-ethyl-, dimethyl ester (9CI) (CA INDEX

NAME)
FS 3D CONCORD
MF C11 H13 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



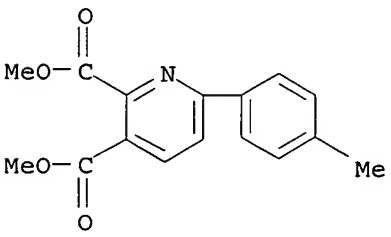
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

L41 ANSWER 35 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92487-61-1** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-(4-methylphenyl)-, dimethyl ester (9CI)
(CA INDEX NAME)
FS 3D CONCORD
MF C16 H15 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

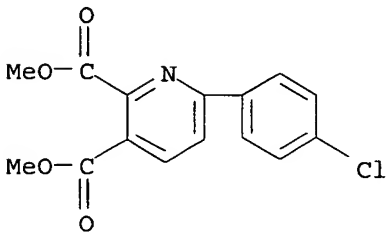
2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

L41 ANSWER 36 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **92487-60-0** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-(4-chlorophenyl)-, dimethyl ester (9CI)

(CA INDEX NAME)
FS 3D CONCORD
MF C15 H12 Cl N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



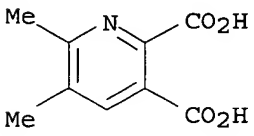
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

L41 ANSWER 37 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-96-8** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 5,6-dimethyl- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C9 H9 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

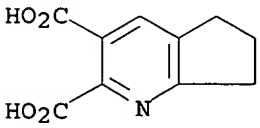
2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:55090

L41 ANSWER 38 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-95-7** REGISTRY
CN 5H-Cyclopenta[b]pyridine-2,3-dicarboxylic acid, 6,7-dihydro- (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN 5H-1-Pyrindine-2,3-dicarboxylic acid, 6,7-dihydro-
FS 3D CONCORD

MF C10 H9 N O4
LC STN Files: CA, CAPLUS, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



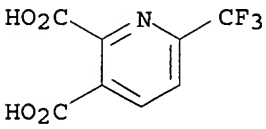
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:55090

L41 ANSWER 39 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-94-6** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-(trifluoromethyl)- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C8 H4 F3 N O4
LC STN Files: CA, CAPLUS, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



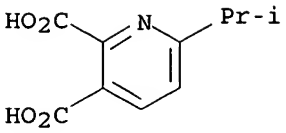
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:55090

L41 ANSWER 40 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-93-5** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-(1-methylethyl)- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C10 H11 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

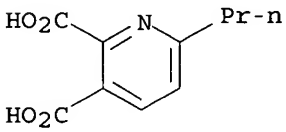
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

REFERENCE 3: 101:55090

L41 ANSWER 41 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-92-4** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-propyl- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C10 H11 N O4
LC STN Files: BEILSTEIN*, CA, CAPLUS, CASREACT, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

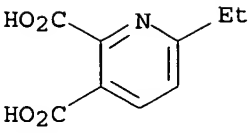
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

REFERENCE 3: 101:55090

L41 ANSWER 42 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-91-3** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-ethyl- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C9 H9 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

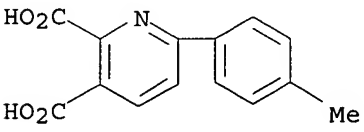
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

REFERENCE 3: 101:55090

L41 ANSWER 43 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-90-2** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-(4-methylphenyl)- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C14 H11 N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

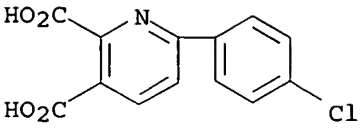
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

REFERENCE 3: 101:55090

L41 ANSWER 44 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-89-9** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-(4-chlorophenyl)- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C13 H8 Cl N O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

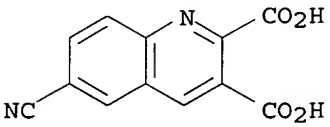
3 REFERENCES IN FILE CA (1907 TO DATE)
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 101:171115

REFERENCE 3: 101:55090

L41 ANSWER 45 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-88-8** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-cyano- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C12 H6 N2 O4
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

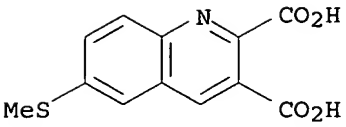
REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

REFERENCE 5: 101:55090

L41 ANSWER 46 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-87-7** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 6-(methylthio)- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C12 H9 N O4 S
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

4 REFERENCES IN FILE CA (1907 TO DATE)
4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

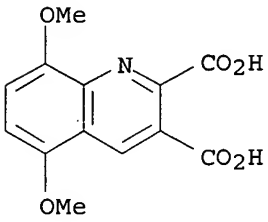
REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

REFERENCE 3: 106:213943

REFERENCE 4: 101:55090

L41 ANSWER 47 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **90376-86-6** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 5,8-dimethoxy- (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C13 H11 N O6
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL
DT.CA CAplus document type: Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 113:115107

REFERENCE 2: 107:134222

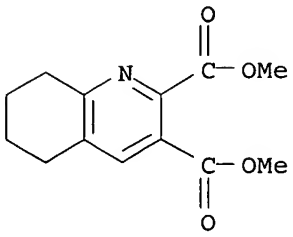
REFERENCE 3: 106:213943

REFERENCE 4: 101:171123

REFERENCE 5: 101:55090

L41 ANSWER 48 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **82132-56-7** REGISTRY
CN 2,3-Quinolinedicarboxylic acid, 5,6,7,8-tetrahydro-, dimethyl ester (9CI)
(CA INDEX NAME)

FS 3D CONCORD
MF C13 H15 N O4
LC STN Files: CA, CAPLUS
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: PREP (Preparation)



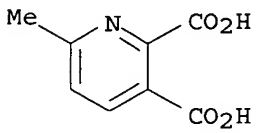
PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 106:213943

REFERENCE 2: 97:23588

L41 ANSWER 49 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **53636-70-7** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-methyl- (6CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN 6-Methyl-2,3-pyridinedicarboxylic acid
FS 3D CONCORD
MF C8 H7 N O4
LC STN Files: BEILSTEIN*, CA, CAOLD, CAPLUS, CASREACT, CHEMCATS, MSDS-OHS, TOXCENTER, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent); USES (Uses); NORL (No role in record)
RL.NP Roles from non-patents: ANST (Analytical study); BIOL (Biological study); PREP (Preparation); PRP (Properties); RACT (Reactant or reagent); NORL (No role in record)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

21 REFERENCES IN FILE CA (1907 TO DATE)
21 REFERENCES IN FILE CAPLUS (1907 TO DATE)
5 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 140:332510

REFERENCE 2: 140:249058

REFERENCE 3: 139:316187

REFERENCE 4: 137:263078

REFERENCE 5: 136:95568

REFERENCE 6: 126:199573

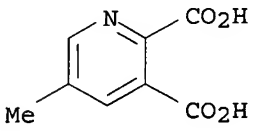
REFERENCE 7: 125:127644

REFERENCE 8: 116:78047

REFERENCE 9: 114:228750

REFERENCE 10: 113:6374

L41 ANSWER 50 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **53636-65-0** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 5-methyl- (6CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN 5-Methylpyridine-2,3-dicarboxylic acid
FS 3D CONCORD
MF C8 H7 N O4
CI COM
LC STN Files: BEILSTEIN*, CA, CAOLD, CAPLUS, CASREACT, CHEMLIST, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
RL.NP Roles from non-patents: ANST (Analytical study); PREP (Preparation); PROC (Process); PRP (Properties); NORL (No role in record)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

22 REFERENCES IN FILE CA (1907 TO DATE)
22 REFERENCES IN FILE CAPLUS (1907 TO DATE)
1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 129:81732

REFERENCE 2: 126:350979

REFERENCE 3: 126:2963

REFERENCE 4: 125:74973

REFERENCE 5: 123:47024

REFERENCE 6: 121:205332

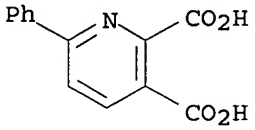
REFERENCE 7: 121:35349

REFERENCE 8: 120:163986

REFERENCE 9: 117:253886

REFERENCE 10: 117:150900

L41 ANSWER 51 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **39633-01-7** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-phenyl- (7CI, 9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C13 H9 N O4
LC STN Files: BEILSTEIN*, CA, CAOLD, CAPLUS, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent); NORL (No role in record)
RL.NP Roles from non-patents: RACT (Reactant or reagent); NORL (No role in record)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)
2 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 106:213943

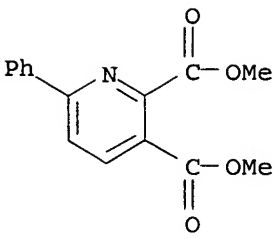
REFERENCE 2: 101:171115

REFERENCE 3: 78:43400

REFERENCE 4: 60:10168

REFERENCE 5: 56:60545

L41 ANSWER 52 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **39632-98-9** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-phenyl-, dimethyl ester (9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C15 H13 N O4
LC STN Files: BEILSTEIN*, CA, CAPLUS, CASREACT, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: PREP (Preparation)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 130:168220

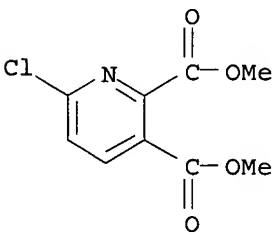
REFERENCE 2: 119:139200

REFERENCE 3: 106:213943

REFERENCE 4: 101:171115

REFERENCE 5: 78:43400

L41 ANSWER 53 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **32383-03-2** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 6-chloro-, dimethyl ester (8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN 6-Chloro-2,3-pyridinedicarboxylic acid dimethyl ester
CN Dimethyl 6-chloropyridine-2,3-dicarboxylate
FS 3D CONCORD
MF C9 H8 Cl N O4
LC STN Files: BEILSTEIN*, CA, CAPLUS, CASREACT, CHEMCATS, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation); RACT (Reactant or reagent)
RL.NP Roles from non-patents: PREP (Preparation); RACT (Reactant or reagent)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

9 REFERENCES IN FILE CA (1907 TO DATE)
9 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 138:368723

REFERENCE 2: 138:331196

REFERENCE 3: 130:139260

REFERENCE 4: 128:154014

REFERENCE 5: 124:8792

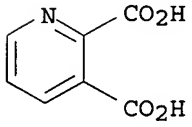
REFERENCE 6: 113:6374

REFERENCE 7: 106:213955

REFERENCE 8: 106:213954

REFERENCE 9: 74:111432

L41 ANSWER 54 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **18970-62-2** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, copper(2+) salt (1:1) (8CI, 9CI) (CA INDEX NAME)
MF C7 H5 N O4 . Cu
LC STN Files: BEILSTEIN*, CA, CAPLUS, CHEMLIST, USPATFULL
(*File contains numerically searchable property data)
Other Sources: NDSL**, TSCA**
(**Enter CHEMLIST File for up-to-date regulatory information)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
RL.NP Roles from non-patents: PREP (Preparation)
CRN (89-00-9)



● Cu(II)

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:65213

REFERENCE 2: 136:390755

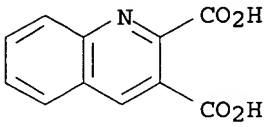
REFERENCE 3: 123:240266

REFERENCE 4: 107:156992

REFERENCE 5: 69:18729

L41 ANSWER 55 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **643-38-9** REGISTRY
CN 2,3-Quinolinedicarboxylic acid (7CI, 8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN Acridinic acid
CN NSC 26342
FS 3D CONCORD

MF C11 H7 N O4
CI COM
LC STN Files: BEILSTEIN*, BIOSIS, CA, CAOLD, CAPLUS, CASREACT, CHEMCATS, CHEMLIST, MEDLINE, SPECINFO, TOXCENTER, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: BIOL (Biological study); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses); NORL (No role in record)
RLD.P Roles for non-specific derivatives from patents: BIOL (Biological study); USES (Uses)
RL.NP Roles from non-patents: BIOL (Biological study); PREP (Preparation); PROC (Process); RACT (Reactant or reagent); NORL (No role in record)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

42 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
42 REFERENCES IN FILE CAPLUS (1907 TO DATE)
1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 137:6073

REFERENCE 2: 130:121846

REFERENCE 3: 127:38753

REFERENCE 4: 124:302434

REFERENCE 5: 121:151962

REFERENCE 6: 120:238898

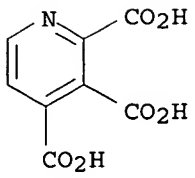
REFERENCE 7: 120:163986

REFERENCE 8: 119:181236

REFERENCE 9: 117:253886

REFERENCE 10: 117:150900

L41 ANSWER 56 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **632-95-1** REGISTRY
CN 2,3,4-Pyridinetricarboxylic acid (6CI, 7CI, 9CI) (CA INDEX NAME)
FS 3D CONCORD
MF C8 H5 N O6
LC STN Files: BEILSTEIN*, BIOSIS, CA, CAOLD, CAPLUS, HODOC*, USPAT2, USPATFULL
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PROC (Process); USES (Uses)
RL.NP Roles from non-patents: NORL (No role in record)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

8 REFERENCES IN FILE CA (1907 TO DATE)
8 REFERENCES IN FILE CAPLUS (1907 TO DATE)
3 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 138:410670

REFERENCE 2: 114:233282

REFERENCE 3: 64:11467

REFERENCE 4: 59:5766

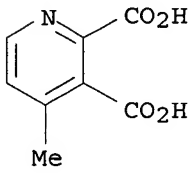
REFERENCE 5: 52:50588

REFERENCE 6: 50:1510

REFERENCE 7: 44:7596

REFERENCE 8: 37:27274

L41 ANSWER 57 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **517-40-8** REGISTRY
CN 2,3-Pyridinedicarboxylic acid, 4-methyl- (6CI, 8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN 4-Methylpyridine-2,3-dicarboxylic acid
FS 3D CONCORD
MF C8 H7 N O4
LC STN Files: BEILSTEIN*, CA, CAOLD, CAPLUS, CASREACT
(*File contains numerically searchable property data)
DT.CA CAplus document type: Journal; Patent
RL.P Roles from patents: PREP (Preparation)
RL.NP Roles from non-patents: PREP (Preparation); NORL (No role in record)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)
1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 113:6374

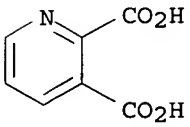
REFERENCE 2: 112:198071

REFERENCE 3: 109:210908

REFERENCE 4: 82:11036

REFERENCE 5: 55:124845

L41 ANSWER 58 OF 58 REGISTRY COPYRIGHT 2004 ACS on STN
RN **89-00-9** REGISTRY
CN 2,3-Pyridinedicarboxylic acid (8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN NSC 13127
CN NSC 18836
CN NSC 403247
CN Quinolinic acid
FS 3D CONCORD
MF C7 H5 N O4
CI COM
LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, BEILSTEIN*, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CANCERLIT, CAOLD, CAPLUS, CASREACT, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN, CSCHEM, DDFU, DRUGU, EMBASE, GMELIN*, HODOC*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MRCK*, NIOSHTIC, PROMT, PS, RTECS*, SPECINFO, SYNTHLINE, TOXCENTER, ULIDAT, USPAT2, USPATFULL
(*File contains numerically searchable property data)
Other Sources: EINECS**, NDSL**, TSCA**
(**Enter CHEMLIST File for up-to-date regulatory information)
DT.CA CAplus document type: Book; Conference; Dissertation; Journal; Patent; Report
RL.P Roles from patents: ANST (Analytical study); BIOL (Biological study); FORM (Formation, nonpreparative); OCCU (Occurrence); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses); NORL (No role in record)
RLD.P Roles for non-specific derivatives from patents: ANST (Analytical study); BIOL (Biological study); FORM (Formation, nonpreparative); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses)
RL.NP Roles from non-patents: ANST (Analytical study); BIOL (Biological study); FORM (Formation, nonpreparative); MSC (Miscellaneous); OCCU (Occurrence); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses); NORL (No role in record)
RLD.NP Roles for non-specific derivatives from non-patents: ANST (Analytical study); BIOL (Biological study); FORM (Formation, nonpreparative); PREP (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or reagent); USES (Uses)



PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT

1791 REFERENCES IN FILE CA (1907 TO DATE)
76 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
1792 REFERENCES IN FILE CAPLUS (1907 TO DATE)
20 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 141:66487

REFERENCE 2: 141:52077

REFERENCE 3: 141:23425

REFERENCE 4: 141:21621

REFERENCE 5: 141:7205

REFERENCE 6: 141:5973

REFERENCE 7: 140:421979

REFERENCE 8: 140:401562

REFERENCE 9: 140:356418

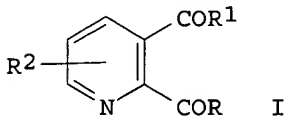
REFERENCE 10: 140:355038

=> □

=> d stat que nos
L3 STR
L11 2416 SEA FILE=REGISTRY SSS FUL L3
L13 67 SEA FILE=REGISTRY ABB=ON PLU=ON 8-HYDROXYQUINOLIN?/CN
L49 319 SEA FILE=CASREACT ABB=ON PLU=ON L11/PRO
L50 332 SEA FILE=CASREACT ABB=ON PLU=ON L13/RCT
L51 7 SEA FILE=CASREACT ABB=ON PLU=ON L49 AND L50

=> d ibib abs fhit

L51 ANSWER 1 OF 7 CASREACT COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 112:198071 CASREACT
TITLE: Ozonolysis of quinolines: a versatile synthesis of polyfunctional pyridines
AUTHOR(S): O'Murchu, C.
CORPORATE SOURCE: Forschungsabt. Org. Chem., Lonza A.-G., Visp, CH-3930, Switz.
SOURCE: Synthesis (1989), (11), 880-82
CODEN: SYNTBF; ISSN: 0039-7881
DOCUMENT TYPE: Journal
LANGUAGE: English
GI

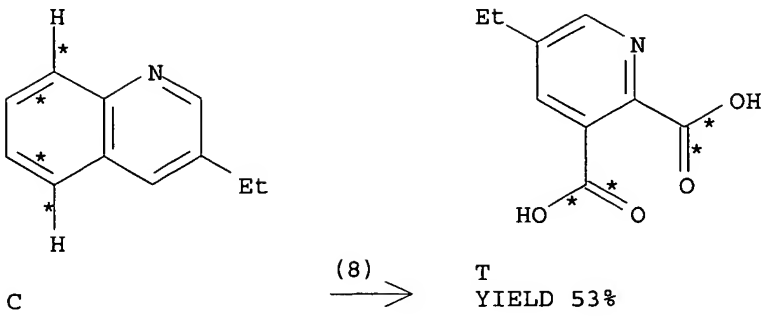


I

AB A simple, safe and efficient procedure, easily adapted to a large scale, is described for the synthesis of substituted quinolones which are readily oxidized by ozone in the presence of mineral acid, followed by an oxidative work up with hydrogen peroxide to afford substituted 2,3-pyridinedicarboxylic acids I (R = R1 = OH, R2 = H, 4-, 5-, 6-Me, 5-Et)

and acyl pyridines I (R = Me, R1 = Me, OH, R2 = H).

RX(8) OF 30 ...C ===> **T**



YIELD 53%

RX(8) RCT C 1873-54-7

STAGE(1)
RGT U 10028-15-6 Ozone, V 64-19-7 AcOH, E 7664-93-9 H2SO4
SOL 7732-18-5 Water

STAGE(2)
RGT W 7722-84-1 H2O2
SOL 7732-18-5 Water
PRO T **102268-15-5**

=> d ibib abs fhit 2-7

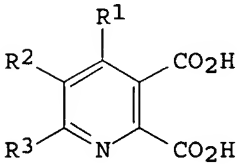
L51 ANSWER 2 OF 7 CASREACT COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 109:54676 CASREACT
TITLE: Preparation of pyridine-2,3-dicarboxylates as intermediates for herbicides
INVENTOR(S): Rieker, William Frederick; Daniels, William Alan
PATENT ASSIGNEE(S): American Cyanamid Co., USA
SOURCE: Eur. Pat. Appl., 9 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 259687	A2	19880316	EP 1987-112278	19870825
EP 259687	A3	19890531		
EP 259687	B1	19910703		
R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE				
US 4816588	A	19890328	US 1987-85916	19870819
AT 64923	E	19910715	AT 1987-112278	19870825
ES 2028834	T3	19920716	ES 1987-112278	19870825
IN 168450	A	19910406	IN 1987-CA697	19870902
IL 83795	A1	19920621	IL 1987-83795	19870906
CS 270573	B2	19900712	CS 1987-6529	19870909
HU 48211	A2	19890529	HU 1987-4031	19870910
HU 203535	B	19910828		
CA 1297112	A1	19920310	CA 1987-546560	19870910

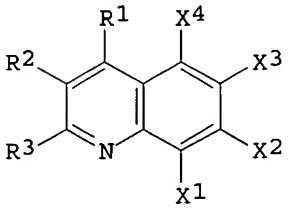
DK 8704753	A	19880313	DK 1987-4753	19870911
DK 169518	B1	19941121		
AU 8778282	A1	19880317	AU 1987-78282	19870911
AU 599698	B2	19900726		
ZA 8706838	A	19880427	ZA 1987-6838	19870911
BR 8704717	A	19880503	BR 1987-4717	19870911
JP 63119466	A2	19880524	JP 1987-226733	19870911
JP 07116153	B4	19951213		
DD 262227	A5	19881123	DD 1987-306903	19870911
SU 1690543	A3	19911107	SU 1987-4203342	19870911
PRIORITY APPLN. INFO.:			US 1986-906713	19860912
			EP 1987-112278	19870825

OTHER SOURCE(S): MARPAT 109:54676

GI



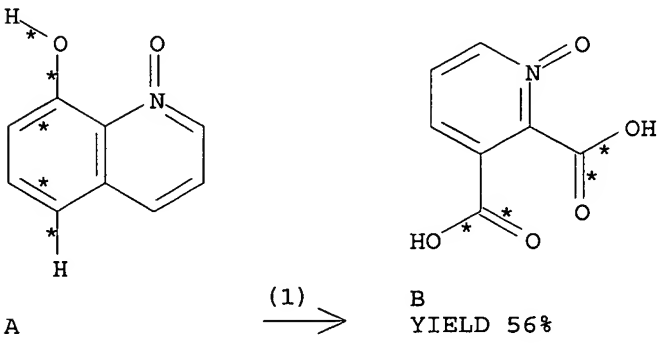
I



II

AB The title compds. I [R1 - R3 = H, (hydroxy)alkyl, alkoxy, phenoxy, haloalkyl, NO2, OH, etc.; R2R3 = atoms to form a ring which may be optionally substituted, in which YZ (sic) are represented by (CH2)2Q, (CH)2Q, wherein Q = O, S, N, with the proviso that R1 = H], useful as intermediates for herbicides, were prepared from quinoline II (R1 - R3 = as given above; X1 - X4 = OH, H, SO3H, SO2Cl, etc.; 1 of X1 - X4 is other than H). To a stirred mixture of KOH and 3-ethyl-8-hydroxyquinoline (preparation given) at 90° was added 30% H2O2 over 3.25 h. The mixture was then heated at 90° for a further 1-2 h to give 5-ethylpyridine-2,3-dicarboxylic acid.

RX(1) OF 5 **A** ===> **B**



A B

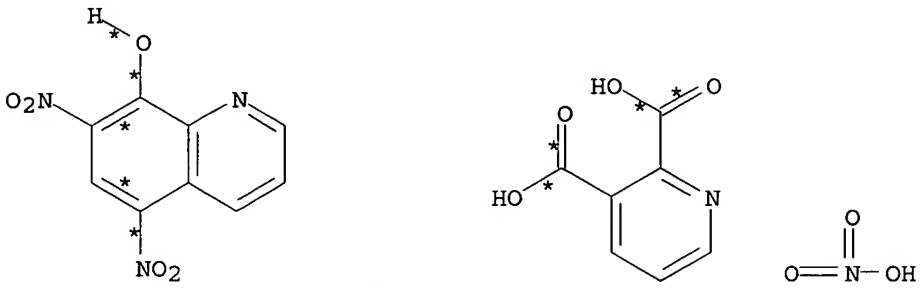
YIELD 56%

RX(1) RCT A **1127-45-3**
RGT C 7722-84-1 H2O2
PRO B **38557-80-1**

L51 ANSWER 3 OF 7 CASREACT COPYRIGHT 2004 ACS on STN

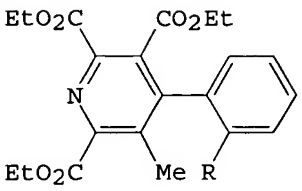
ACCESSION NUMBER: 106:102055 CASREACT
TITLE: Thermal fragmentations of nitrated 8-quinolinols
AUTHOR(S): Sutter, Peter; Weis, Claus D.
CORPORATE SOURCE: Res. Dev. Dep., CIBA-GEIGY LTD., Basel, Switz.
SOURCE: Journal of Heterocyclic Chemistry (1986), 23(1), 29-32
CODEN: JHTCAD; ISSN: 0022-152X
DOCUMENT TYPE: Journal
LANGUAGE: English
AB 8-Quinolinols which were substituted in the aromatic nucleus by nitro-, chloro-, or sulfonic acid groups underwent a neat thermal fragmentation upon heating in 75% nitric acid as reaction medium to yield 2,3-dicarboxypyridinium nitrate. The scope and the mechanism of these reactions are discussed.

RX(1) OF 16 ...A ===> **B**...

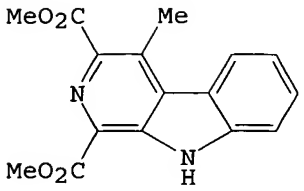


RX(1) RCT A 1084-32-8
RGT C 7697-37-2 HNO3
PRO B **106997-81-3**
SOL 7732-18-5 Water
NTE thermal

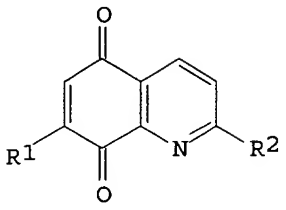
L51 ANSWER 4 OF 7 CASREACT COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 104:129685 CASREACT
TITLE: Inverse electron demand Diels-Alder reactions of heterocyclic azadienes. Studies on the total synthesis of lavendamycin: investigative studies on the preparation of the CDE β-carboline ring system and AB quinoline-5,8-quinone ring system
AUTHOR(S): Boger, Dale L.; Duff, Steven R.; Panek, James S.; Yasuda, Masami
CORPORATE SOURCE: Dep. Med. Chem., Univ. Kansas, Lawrence, KS, 66045-2500, USA
SOURCE: Journal of Organic Chemistry (1985), 50(26), 5782-9
CODEN: JOCEAH; ISSN: 0022-3263
DOCUMENT TYPE: Journal
LANGUAGE: English
GI



I



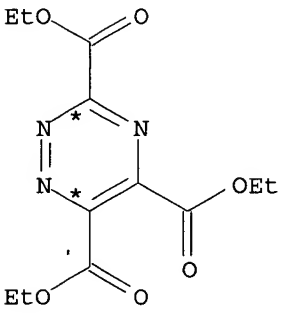
II



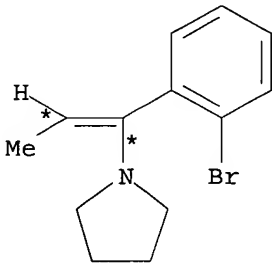
III

AB Enamines of 2-RC6H4COEt (R = Br, F) underwent [4 + 2] cycloaddn. with tri-Et 1,2,4-triazine-3,5,6-tricarboxylate to give the pyridines I. I (R = Br) was converted to the indolopyridine II via transesterification, Schmidt reaction, and (Ph3P)4Pd-mediated ring closure. The aminoquinolinedione III (R1 = NH2, R2 = H) was prepared via oxidn of 7-bromo-5-nitro-8-quinolinol to III (R1 = Br, R2 = H), reaction with NaN3, treatment of III (R1 = N3, R2 = H) with PPh3, and hydrolysis of the imine. III (R1 = NH2, R2 = 2-pyridyl) was similarly prepared

RX(3) OF 46 2 C + 2 H ===> **K** + **L**

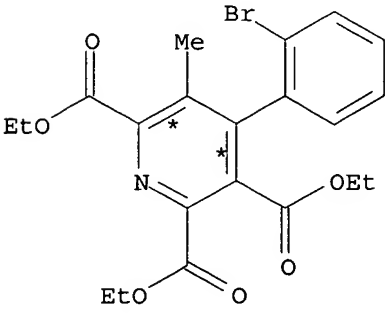


2 C

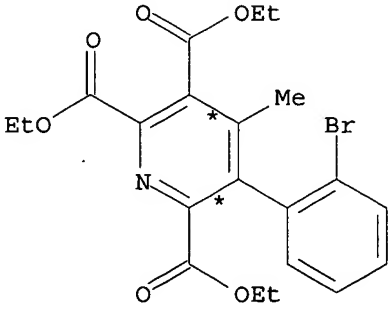


2 H

(3) ⟶



K



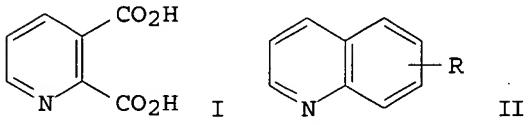
L

RX(3) RCT C 74476-38-3, H 92611-55-7
PRO K **92628-24-5**, L **99573-35-0**
SOL 75-09-2 CH2Cl2, 7727-37-9 N2

L51 ANSWER 5 OF 7 CASREACT COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 99:122312 CASREACT
TITLE: Quinolinic acid
INVENTOR(S): Orth, Winfried; Pastorek, Emmerich; Fickert, Werner
PATENT ASSIGNEE(S): Ruetgerswerke A.-G., Fed. Rep. Ger.
SOURCE: Ger. Offen., 10 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

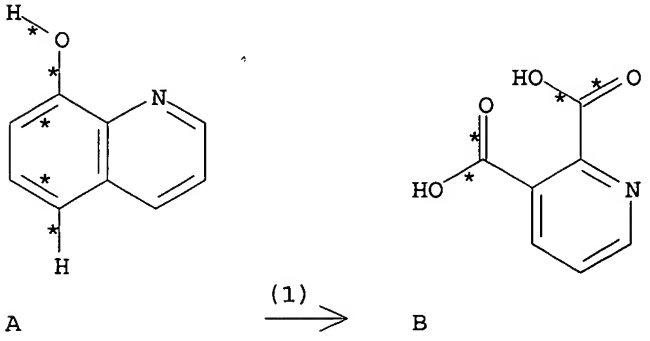
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 3150005	A1	19830623	DE 1981-3150005	19811217
EP 82542	A2	19830629	EP 1982-201240	19821006
EP 82542	A3	19830831		
EP 82542	B1	19850515		
R: CH, DE, FR, GB, LI, NL				
JP 58105964	A2	19830624	JP 1982-217897	19821214
JP 61047836	B4	19861021		
PRIORITY APPLN. INFO.:			DE 1981-3150005	19811217

GI



AB The title compound (I) was prepared from quinolines II [R = OR1, SR1, NR1R2, NHNHR1, N+R13, NHCOR1; R1,R2 = H, (un)substituted alkyl, aralkyl, cycloalkyl], optionally having addnl. substituents on the benzene ring, by oxidation with chlorates in presence of a vanadate catalyst. Thus, 8-quinolinol in aqueous H2SO4 was treated with NaClO3 in presence of NH4VO3 at 90-103° to give 72.8% I.

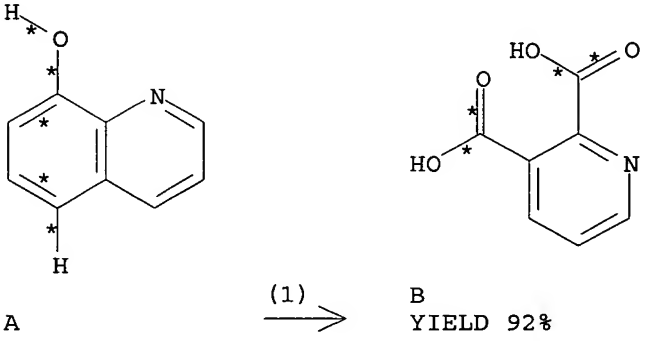
RX(1) OF 1 **A** ===> **B**



RX(1) RCT A **148-24-3**
PRO B **89-00-9**

L51 ANSWER 6 OF 7 CASREACT COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 44:12624 CASREACT
TITLE: Preparation of quinolinic and cinchomeronic acids by ozone oxidation
AUTHOR(S): Lindenstruth, Albert F.; VanderWerf, Calvin A.
CORPORATE SOURCE: Univ. of Kansas, Lawrence
SOURCE: Journal of the American Chemical Society (1949), 71, 3020-1
CODEN: JACSAT; ISSN: 0002-7863
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable
AB 8-Hydroxyquinoline in AcOH, treated 48 hrs. at room temperature with 9-10% O3 in O (20 l./hr.), 110 g. 30% H2O2 added, and the mixture refluxed 2 hrs., gives 92% quinolinic acid; the 6-NH2, 6-F, 6-NO2, and 6-fluoro-8-nitro derivs. yield 65, 15, 6, and 44% acid, resp.; quinoline yields only traces of acid. Isoquinoline gives 44.5% cinchomeronic acid (10% after ozonization for 12 hrs.); 49.5% o-C6H4(CO2H)2 was also isolated.

RX(1) OF 2 **A** ===> **B**



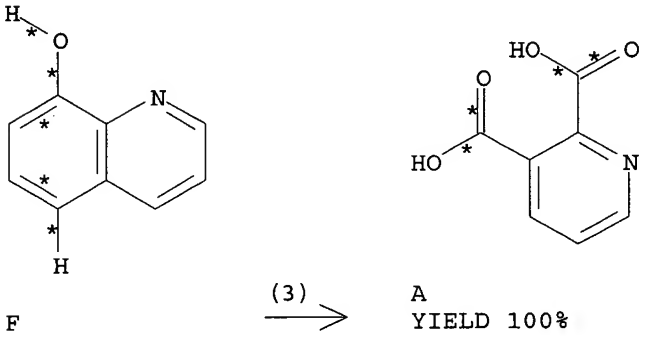
A B
YIELD 92%

RX(1) RCT A **148-24-3**
RGT C 7722-84-1 H2O2
PRO B **89-00-9**
SOL 64-19-7 AcOH
NTE Classification: Ozonolysis; Ring cleavage; Oxidative cleavage; Chemoselective; # Conditions: O3 AcOH; 48h 20 deg; H2O2; 2h Rf

L51 ANSWER 7 OF 7 CASREACT COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 42:41813 CASREACT
TITLE: Preparation of 3-(2-hydroxyethyl)pyridine
AUTHOR(S): Dornow, Alfred; Schacht, Wilhelm
CORPORATE SOURCE: Tech. Hochschule, Hannover, Germany
SOURCE: Chemische Berichte (1947), 80, 505-9
CODEN: CHBEAM; ISSN: 0009-2940
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable
AB Attempts to prepare 3-(2-hydroxyethyl)-2-methylpyridine analogous to the 5-(2-hydroxyethyl)-4-methylthiazole component of vitamin BI (I) from the corresponding 3-AcOCH2CO compound by Clemmensen reduction had given the

(1-hydroxyethyl) compound, which, as well as 3-(1-hydroxyethyl)pyridine itself, yielded with the pyrimidine component of I compds. (II) having I activity in the pigeon test (C.A. 34, 5845.5). Since the (1-hydroxyethyl) isomer of I showed no aneuritic action (C.A. 37, 3091.5) it was to be expected that the (2-hydroxyethyl) isomers of compds. of this type would have increased vitamin activity. 1-(4-Amino-2-methyl-5-pyrimidylmethyl)-3-(2-hydroxyethyl)pyridinium chloride-HCl (III) was accordingly prepared by the following series of reactions. Quinolinic acid nitrate, C7H5NO4.HNO3, m. 152-4° (from dilute HNO3), prepared quantitatively from 8-hydroxyquinoline and HNO3 (d. 1.4) at 0-5°, was converted by heating 3 hrs. at 200-10° into nicotinic acid, m. 224-6° (85-90%), thence through the Me ester and hydrazide into the phenylsulfonylhydrazide which, decomposed with Na2CO3 in glycerol at 160°, gave, along with Ph2S2, 36% 3-pyridinecarboxaldehyde, b18 88-90°; this, heated 2 hrs. on the water bath with 1 mol. CH2(CO2H)2 in pyridine and a couple drops of piperidine, yielded 90-5% 3-pyridineacrylic acid, quantitatively hydrogenated by Pt oxide in water in 6-8 hrs. to 3-pyridinepropionic acid, m. 160-2° (from alc. or much AcOEt); Me ester (75-80% by refluxing the acid 3 hrs. in MeOH-concentrated H2SO4), b12 134.2-4.4°; amide (quant. yield from the ester allowed to stand several hrs. with 5 vols. concentrated NH4OH), prisms from acetone, m. 118-19°, converted by Br and KOH on the water bath into 3-(2-aminoethyl)pyridine, b14 115.0-15.4°, very hygroscopic and sensitive to CO2 (dipicrate, leaflets or needles from water, m. 211-12°; HCl salt, m. 204-5° (from alc. or alc.-acetone)); treated in ice-cold N H2SO4 with NaNO2 and heated on the water bath, the amine gave 75-80% 3-(2-hydroxyethyl)pyridine, b10 144.0-4.5° (urethan, scales from water, m. 100-2°), which, heated with 4-amino-5-(chloromethyl)-2-methylpyrimidine-HCl in PhNO2 1 hr. at 40°, gave 45-8% III, druses with 1 H2O from MeOH-Me2CO, m. 212-14°. Physiol. tests on III will be reported later.

RX(3) OF 4 **F** ===> **A**...



F A
YIELD 100%

RX(3) RCT F **148-24-3**
RGT G 7697-37-2 HNO3
PRO A **89-00-9**
NTE Classification: Oxidative cleavage; Ring cleavage; Chemoselective; # Conditions: HNO3 1h 0-5 deg; # Comments: product is a nitrate salt

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